Health Disparities in Texas:

An Epidemiologic Review of Priority Health Outcomes

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Health Disparities in Texas

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Acknowledgments

This document has been developed in preparation for the implementation of HB 757 of the 77th Legislature sponsored by State Representative Garnet Coleman. The legislation creates a statewide Health Disparities Task Force to assist the Texas Department of Health (TDH) in eliminating health and health access disparities in Texas.

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EXECUTIVE SUMMARY

The Texas Department of Health (TDH) is the agency primarily tasked with eliminating and reducing health disparities, and strives to identify populations at highest risk of disease to more effectively target prevention and control activities. Within the numerous programs devoted to disease surveillance, risk reduction, and community education, health disparities are routinely identified but are not necessarily the primary focus of program activities.

To focus and add structure to various targeted health disparity activities at TDH, the 77th Legislature in 2001 passed HB757, legislation that created a statewide Health Disparities Task Force. The Health Disparities Task Force is charged with developing recommendations to assist the Texas Department of Health in accomplishing the following goals: 1) to eliminate health and health access disparities in Texas among multicultural, disadvantaged, and regional populations; and 2) to reorganize Department programs to eliminate those disparities. To develop a strategic plan for the elimination of health disparities and to coordinate the multitude of prevention activities that may encompass health disparity elimination goals, a review of current health status of specific population groups in Texas and of relevant TDH activities is necessary. Toward this end, this report was developed to provide an overview of Texas health disparities in eight priority health areas and one health access area. These priority health areas include six focus areas recommended from the US Department of Health and Human Services (infant mortality, cancer, cardiovascular disease, diabetes, HIV/AIDS, and immunizations) as well as certain areas relevant to the Texas population (access to health care, neural tube defects, and tuberculosis).

Much of the disparity in the eight priority health outcomes is related to health care access. Improved access to primary health care services promotes good health, reduces morbidity, and decreases complications from chronic disease. However, disparities exist among Texans in access to health care and, consequently, in their general health and well-being. To remove access disparities among populations, the impact of various “access barriers” that impede the delivery of health care must be addressed by public health professionals, planners and legislators. These access barriers include health insurance, income, and availability of and proximity to health care providers.

Note the following disparities:

- The rate of uninsured for all Texans is 24 percent; for non-Hispanic whites, 16%; African-Americans, 28%; Hispanics, 38%.
- Almost half of rural residents in Texas have low incomes compared to 36% of urban dwellers.
- Access to health care is a significant issue in border counties where 65% of residents are considered low-income.
- Twenty-four counties in Texas (9%) have no primary care physicians, 138 counties (54%) have no pediatricians, and 158 counties (62%) have no obstetricians/gynecologists.

Related to the eight priority health outcomes, marked disparities exist by race-ethnic group and by geographic region. African-Americans in Texas have much higher incidence rates of cancer than other groups, particularly for colorectal, prostate, and cervical cancer, cancers for which preventive screenings are available. African-American males also have higher rates of lung cancer than both non-Hispanic whites and Hispanic groups. Although African-American females experience a lower incidence of breast cancer than other groups, they experience higher mortality from this disease. This suggests major disparities in early diagnosis, treatment, and possibly access to care. African-Americans in the state also suffer from the highest mortality rates of heart disease,

stroke, and diabetes than any other group. Rates of HIV/AIDS are markedly higher among African-Americans, reaching near epidemic levels in males (63 AIDS cases per 100,000). Infant and birth health outcomes are the poorest for African-Americans who have infant mortality rates twice that of non-Hispanic whites and have a high proportion of low birth weight babies (13%).

With the exception of cervical cancer, Hispanics in Texas have lower rates of cancer compared to non-Hispanic whites. The cervical cancer death rate is twice as high in Hispanic females as non-Hispanic whites. Neural tube defects are a significant problem in Hispanics particularly among those living along the Texas-Mexico border. Tuberculosis rates are higher among Hispanics as well as African Americans compared to other groups. Diabetes mortality occurs disproportionately among Hispanic Texans, but paradoxically, Hispanics have lower heart disease and cardiovascular mortality than non-Hispanic whites and African-Americans. Finally, although immunization levels are low for all Texas groups compared to the national average, the drop in vaccination coverage has been most notable among Hispanic children.

The development of strategies for eliminating health disparities in Texas may require more systematic investigation of disparities for all high risk groups and research to better understand why these disparities exist.

INTRODUCTION

Health disparities are differences in the incidence, prevalence, mortality, and burden of diseases that exist among variously defined populations. Examples of these health outcomes include differences in survival following medical conditions, such as cancer, or differences in the incidence of medical conditions, such as diabetes. Typically, we consider these disparities to be the disproportionate burden of disease in specific race and ethnic minority groups. However, health disparities may also refer to morbidity and mortality differences among groups defined by geographic region, gender, or age. Underlying factors which contribute to health disparities include socioeconomic factors, risk behaviors, cultural mores, attitudes toward prevention, and genetic susceptibility.

National Agenda on Health Disparities

Because health disparities among population groups in the US continue to persist, there has been a concerted national effort to address and eliminate the unequal burden of disease experienced by many populations. In *Healthy People (HP) 2010*, the current prevention agenda for the nation, two overarching goals were laid out: 1) to increase the quality and years of healthy life and 2) to eliminate health disparities. The choice of the term *"to eliminate disparities*" instead of the *Healthy People 2000* goal *"to reduce disparities"* was symbolic of renewed resolve to refocus efforts and resources on those areas and diseases where disparities exist. In 1998, President Clinton committed the nation to an ambitious goal: by the year 2010 eliminate the disparities experienced by racial and ethnic minority populations in six areas of health status. Federal agencies such as the National Institutes of Health (NIH) and the Health Resources and Services Administration have formulated goals, objectives, and specific actions to address and eliminate health disparities. In 2000, NIH allocated $20 million for implementing their health disparities elimination strategy.

Legislative Mandate to Eliminate Disparities in Texas

In Texas, the State's Department of Health is committed to improving the health status of all Texans, and its programs have historically provided services to underserved, vulnerable, and special needs populations. Within the numerous programs devoted to disease prevention and control, health disparities are routinely identified and are ideally a focus of program activities. Created in 1993, the Office of Minority Health adds further impetus by promoting and coordinating department initiatives to improve the health of the state's minority and disadvantaged populations. To various extents, the Office of Minority Health and other health department programs have adopted the national *Healthy People 2010* goals including the elimination of health disparities and the attainment of risk reduction targets for special population groups.

To focus and add structure to various targeted health disparity activities at the Texas Department of Health (TDH), the 77th Legislature in 2001 passed HB757, legislation that creates a statewide Health Disparities Task Force. The Health Disparities Task Force is charged with developing recommendations to assist TDH in accomplishing the following goals: 1) to eliminate health and health access disparities in Texas among multicultural, disadvantaged, and regional populations; and 2) to reorganize Department programs to eliminate those disparities. The specific duties of the task force are to investigate and report on issues related to health

and health access disparities, develop short-term and long-term strategies to eliminate those disparities, monitor related progress, and advise on implementation of programs to address disparities.

Nine Priority Health Areas for Texas

To develop a strategic plan for the elimination of health disparities and to coordinate the many prevention activities that may encompass health disparity elimination goals, a review of current health status of specific population groups in Texas and of relevant TDH activities is necessary. Toward this end, this report provides an overview of Texas health disparities in selected priority health areas. These priority health areas include six focus areas recommended from the US Department of Health and Human Services (DHHS) (infant mortality, cancer, cardiovascular disease, diabetes, HIV/AIDS, and immunizations) as well as those areas that are particularly relevant to the Texas population (access to health care, neural tube defects, and tuberculosis). The DHHS six health areas reflect areas of disparity that are known to affect multiple racial and ethnic minority groups at all life stages. Five-year goals within these six areas are embedded in the *Healthy People 2010*, the nation's prevention agenda. Reliable national and state data are also available to track progress in these areas. The selection of three other priority areas for this report was based on the specific needs of the Texas population. Access to health care is a critical problem in Texas and improvement in this area would be the underlying basis for improvement in all other health areas. Neural tube defects were selected as a priority issue because of the epidemic of these devastating birth defects in the Hispanic population living along the Texas-Mexico border. Neural tube defects are largely preventable with the simple addition of folic acid to women's diets. Tuberculosis dramatically affects many segments of the Texas population, such as African-Americans, migrants, and the border population.

Thus, this report focuses on nine priority health and health access areas from which to begin developing a strategic plan to eliminate disparities. The nine areas represent health outcomes or issues that show persistent but amenable disparities among race-ethnic and regional groups in Texas. These nine priority areas are:

1) Access to health care
2) Cancer
3) Cardiovascular disease
4) Diabetes
5) HIV/AIDS
6) Immunizations
7) Infant Mortality
8) Neural tube defects
9) Tuberculosis

In this report, data are presented to provide an overview of the disparities that exist within the nine health areas. For each of the nine areas, the importance of each particular disease/condition and the most significant dimensions of health disparities (age, gender, race and ethnicity, regional and geographical) are presented. Each section concludes with a description of relevant program initiatives that address these disparities. To more systematically describe disparities will necessitate improved collection and use of standardized data to accurately

identify all high-risk groups. Health status indicators within each of the nine areas may have to be refined and tracked to monitor the effectiveness of health interventions targeting special groups.

Goals for Strategic Planning

Eliminating health disparities in Texas requires a commitment to identify and address the underlying causes of higher levels of disease in racial and ethnic minority communities. Addressing disparities in the nine priority areas outlined in this report would achieve significant progress towards the overall goal. Research is also needed to understand the relationships between health status and different racial and ethnic minority backgrounds. Strategies for addressing disparities might include enhanced public information and outreach efforts, forging new partnerships with minority and other organizations, and a realignment of health department funding priorities.

Resources

Eliminating Health Disparities in the United States. Health Resources and Services Administration (HRSA) November 2000

Health Disparities: Challenge and Opportunity. Office of Research on Minority Health, National Institutes of Health, U.S. Department of Health and Human Services

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Klein RJ, Hawk SA. Health status indicators: Definitions and national data. Statistical notes: vol. 1 no. 3 Hyattsville, Maryland: National Center for Health Statistics. 1991

TEXAS' HEALTHY PEOPLE 2000 Health Status Indicators by Race and Ethnicity 1980–1996—Texas Department of Health, Bureau of State Health Data and Policy Analysis—July 1998

HEALTHY PEOPLE 2010 Goals and Objectives— http://web.health.gov/healthy people/

ACCESS TO CARE

Improved access to primary health care services promotes good health, reduces morbidity, and decreases complications from chronic disease. Primary health care services are provided to patients by general practice physicians or those trained in the specialties of family practice, internal medicine, obstetrics/gynecology (ObGyn), and pediatrics. These services are also provided by growing numbers of non-physician providers, such as physician assistants and advanced practice nurses. Ensuring access to primary health care for all Texans is crucial to reducing disability, mortality, morbidity, and health care costs. However, because universal access is not available in Texas, disparities exist among Texans in their access to health care and, consequently, in their general health and well-being. In order to eliminate disparities among populations in their access to health care, the impact of various "access barriers" that impede the delivery of health care must be addressed by planners and legislators.

Personal Barriers. Disparities in access to primary care services are influenced by multiple complex and interrelated factors, many of which are personal in nature. For example, individuals may encounter barriers when they have no health insurance or have an insurance plan that is not accepted by a provider, or have a deductible or co-payment, which they are unable to pay. The lack of transportation to and from the provider's office can hinder access, especially if a person must travel to a neighboring town or county to receive care and no public transportation is available, or if the patient is disabled. Cultural and language barriers can discourage individuals from seeking health care from a provider who is not aware of important customs or beliefs of the patient, or who is unable to speak with the individual without an interpreter available.

Geographic Barriers. Factors associated with the geographic location of an individual may affect access to primary care. For example, a certain location may lack the medical or non-medical infrastructure needed to support the practice of a primary care provider. In areas having such infrastructure deficiencies, the local residents may have to commute to distant towns or counties to receive the health care services they need. In Texas, there are 60 counties with no hospital and 40 rural counties that have hospitals, but provide no routine deliveries (Rural Health In Texas 1999-2000).[1] Thus, 100 counties in Texas have no services to women for delivering babies. The "population density" of a county affects access in rural or sparsely populated frontier areas because a physician can not financially support a practice in such counties. In many of these areas, recruiting a non-physician provider to provide healthcare to residents may be the only viable approach toward remedying the physician shortage. Of note, inner-city areas with high population densities may encounter many of the same problems with access as seen in the rural areas, such as the lack of health care infrastructure, poor transportation, and cultural and language barriers. Because rural and inner-city areas have the greatest numbers of poverty and low income populations, these areas present the greatest challenges to planners and legislators in delivering adequate health care services to area residents.

Provider Barriers. Providers themselves greatly influence the availability of health care for Texans. Some providers are overwhelmed with their current patient workload and cannot take new patients. This is especially problematic in rural areas where the permanent patient base

will support only a few physicians, yet the area has a seasonal influx of large numbers of migrant workers or tourists who occasionally need health care services. Providers in many areas may also be frustrated with the reimbursement problems that tend to plague public insurance programs and thus choose to not take patients who rely on either Medicaid or Medicare to pay physician fees. Based on physician responses to surveys completed as part of the Health Professional Shortage Area designation applications, most providers do not offer uninsured low-income patients a choice of payment options, such as a sliding fee scale based on family income and size. These physicians create a barrier to health care access for low-income patients, by limiting their alternatives for obtaining health care.

The national Institute of Medicine (IOM) reports that private rural physicians and private inner-city minority physicians provide a disproportionate share of the health care services in each state. Physician supply studies in Texas are in line with the observation that these practitioner groups provide most of the primary health care services to our state's vulnerable populations.

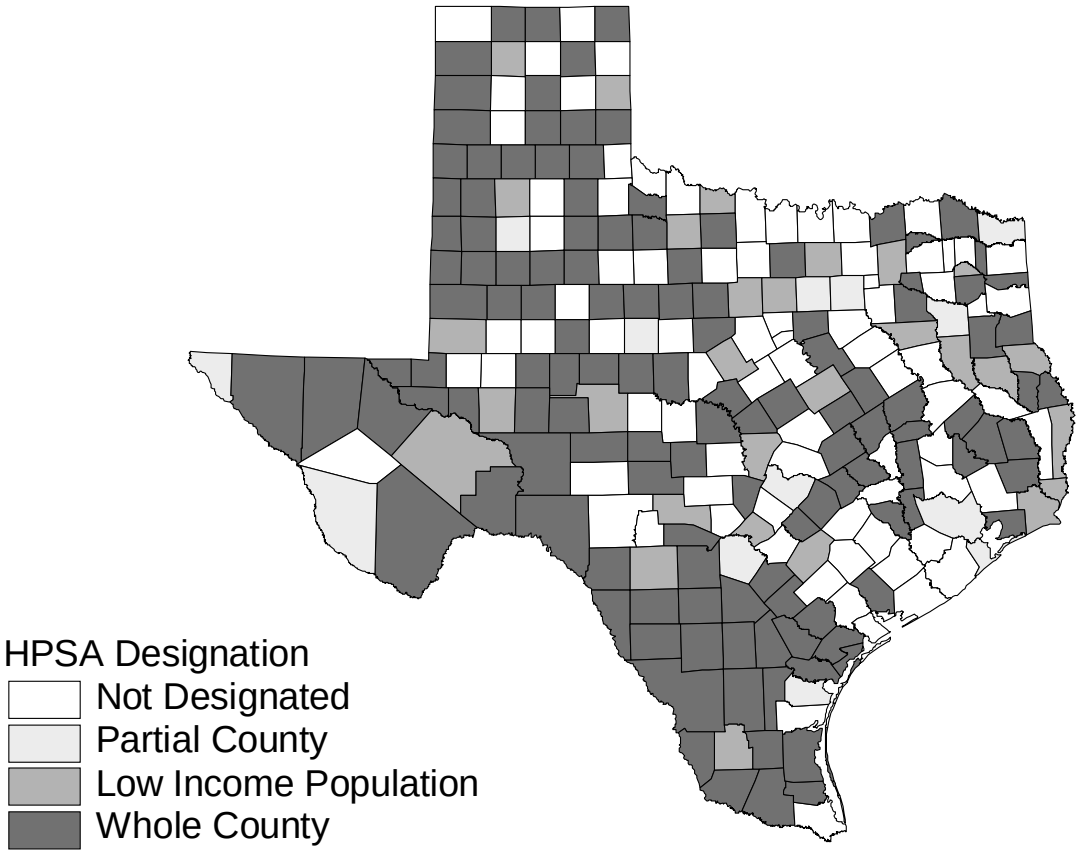
Measuring Access to Primary Care

Health Professional Shortage Areas. The measurement of access to primary healthcare in Texas is governed by federal rules concerning the designation of primary health care Health Professional Shortage Areas (HPSAs). This designation program has been in use for over 20 years and is administered for the U.S. Department of Health and Human Services (DHHS) by the Health Professions Resource Center at the Texas Department of Health, and with the technical support of the Community Health Provider Resources Program. While the program is useful in measuring access to health care in Texas, the method used to designate shortage areas limits our ability to improve access to health care in Texas. The rules governing the program are currently under revision at the DHHS and the proposed rules should improve the measurement of access and disparities in Texas.

HPSA designation activities are conducted either in response to a request from a community representative or because of the federal requirement to update each designation every three years. Thus, there are possibly areas in Texas that have a shortage of primary healthcare services but for which no request for designation has been submitted. According to program rules, the HPSA designation process identifies shortages of primary care providers as a group of five generalist specialties. A shortcoming of the program is that it does not specify shortages of the individual primary care specialties, such as pediatrics or family practice. In general, the HPSA program is adequate as a simple measure of provider shortages and should be used in conjunction with other methods if a comprehensive measurement of access to primary health care is required.

In Texas, 128 whole county geographic areas and 33 partial county areas (in 12 counties) are designated as HPSAs (Figure 1). Twenty-six additional HPSA designations identify shortages of providers for the low-income populations in selected counties. The large number of shortage designations in Texas is substantiated by county supply data collected by the Health Professions Resource Center. Over the past ten years these supply data have confirmed the designations based on the chronic undersupply of providers in the designated counties.

Figure 1. Texas Health Professional Shortage Areas



Income Level. Income may be the best predictor of potential disparities among people in their access to primary health care. Despite having adequate numbers of primary care providers, persons who are low-income often have the most difficulty accessing primary healthcare because they often lack insurance, are underinsured, or lack providers who accept public insurance. Minority populations tend to have disproportionately greater numbers of lower income households compared with their non-minority counterparts; this creates a greater disparity in access to health care. Additionally, low-income populations are more likely to lack transportation to provider services and may have few possibilities for being treated by a provider who is culturally competent or understands their customs and beliefs that affect their health and well-being.

Current Knowledge/Research

Insurance Coverage and Poverty. The Texas Health and Human Services Commission (HHSC) indicated in their report, Demographic Profile of the Texas Population Without Health Insurance from 1996-1998[2] , that 24% of Texans are uninsured, 19% are covered under public insurance programs (Medicaid or Medicare), and 57% have private insurance. Texas has a higher rate of uninsured persons at 24% than does the United States at 18% (Uninsured In America: A Chart Book, Kaiser).[3]

About 64% of uninsured families of all races/ethnicities have incomes below the 200% federal poverty level (FPL), and 30% of those without insurance fall below the 100% FPL. At 100% of the poverty level, Medicaid covers about 42% of the population. Medicaid covers only 6% of those with incomes between 100% and 199% of the FPL (Healthcare of Texas, Texas Comptroller of Public Accounts).[4] According to the HHSC report, "the incidence of uninsurance is significantly higher among persons at the bottom tiers of the poverty income scale, regardless of age or race/ethnicity".

Minorities and Health Insurance. The HHSC report referenced above found that the overall rate of uninsured for all Texans was 24 percent. However, the rates were very different for white and other population at 16 percent, compared with African-American at 28 percent and Hispanic at 38 percent.[2] Because the lack of insurance correlates with the lack of access to health care, it is suggested from these data that the impoverished Hispanic and African-American populations in Texas would likely be more affected than any other population group by disparities in access to health care.

In summary, the data in the report highlight the following facts about the uninsured in Texas based on historical statistics[2] covering the 1996 to 1998 period:

- On any given month, about 1 out of every 4 Texans are likely to lack health insurance coverage. Statewide, the overall rate of uninsured is about 24 percent.
- The rate of uninsured has changed very little over the last ten years.
- The gap between the Texas and the U.S. rate of uninsured has changed very little over the last ten years.
- The rate of uninsured among African-Americans and Hispanics is substantially higher than the average rate for all groups combined.
- Hispanics comprise about 50 percent of all uninsured Texans.
- Adults ages 18 – 34 experience a rate of uninsured that is substantially higher than the one experienced by the population as a whole.
- The rate of uninsured among seniors age 65 or older is close to zero, possibly because of the large impact the Medicare program has had in keeping the rate of uninsured low within this group.
- Children under the age of 18 comprise about 1 out of every 3 uninsured Texans.
- Among persons under the age of 65, about 36 percent of the uninsured live in families and households with incomes of 200 percent of the poverty income level or higher. However, among adults ages 18 – 64, about 40 percent of the uninsured live in families and households with incomes of 200 percent of the poverty income level or higher.
- Non-citizens comprise about 1 out of every 5 uninsured Texans.
- More than two-thirds of uninsured, non-retired adults ages 18 and older, have a job. However, among employed adults the rate of uninsured is substantially lower than among those who are either unemployed or not active in the labor force.
- The majority, about 60 percent, of all uninsured dependent children under the age of 18 live in traditional married-couple families with both parents at home. However, the rate of uninsured is higher among dependent children who live with one parent only.
- About 3 out of every 4 uninsured dependent children under the age of 18 live in families and households with incomes under 200 percent of the poverty income level.

- Among dependent children in families and households with incomes of less than 100 percent of the poverty income level the rate of uninsured is about 36 percent; for those with incomes between 100 and 199 percent of the poverty income level the rate of uninsured is about 35 percent.
- All regions of the state are estimated to have a sizable population of uninsured persons; the regions closer to the border with Mexico are estimated to experience the highest rates of uninsured.
- As of February of 2000, about 1 out every 10 Texans was enrolled in the Medicaid program.
- As of February of 2000, close to 1 out of every 5 Texas children under the age of 19 was enrolled in the Medicaid program.

Supporting Statistics

Poverty. There are more impoverished (< 100% FPL) and low-income (< 200% FPL) individuals living in rural areas of Texas (23%) than in urban areas (17%).* Similarly, 36% of urban dwellers are low-income, whereas almost half (50%) of their rural counterparts are considered low-income. Because income is often the main barrier to accessing primary healthcare, individuals in rural Texas may encounter more difficulty in obtaining primary health care. Counties with the highest rates of poverty likely have the most significant access problems. Figure 2 illustrates that the counties with the highest rates of poverty are in regions 10 (far west Texas) and 11 (south Texas). Seven public health regions have higher poverty rates than the state average of 18% and eight regions have higher percentage of low-income populations than the state average of 38% (Table 1).

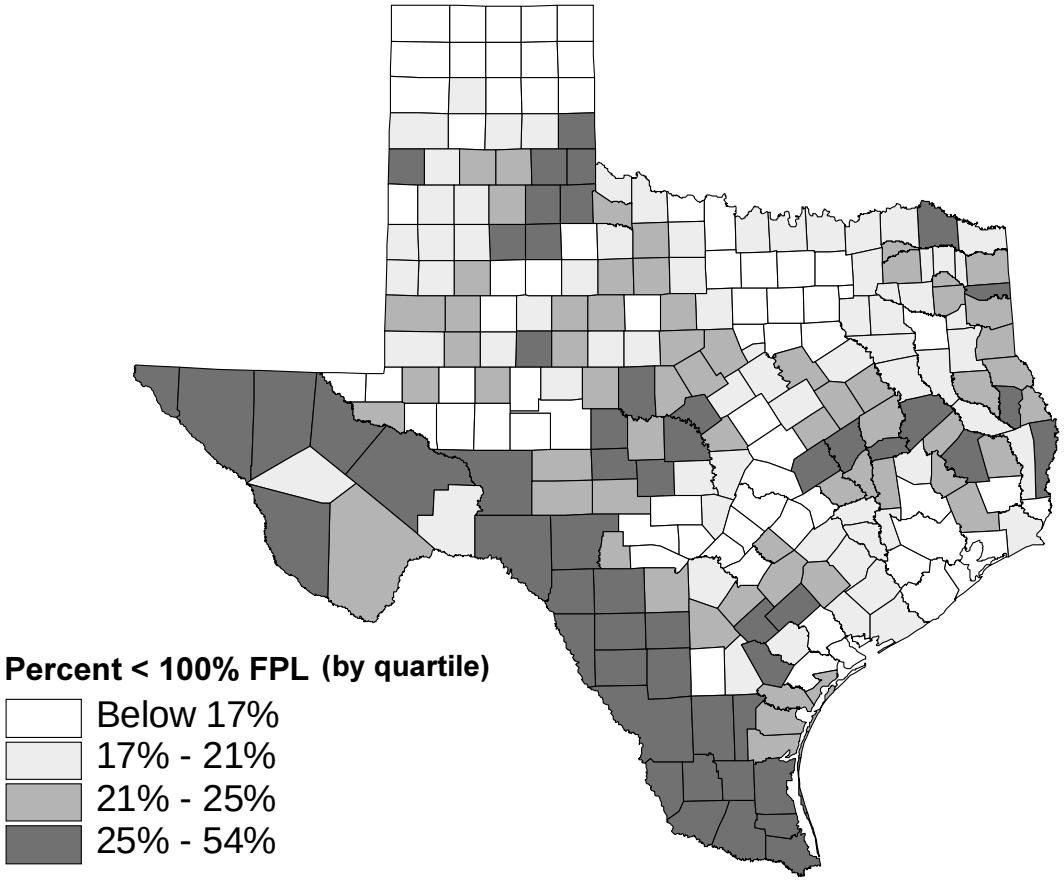
Table 1. Poverty Rates by Public Health Region.

Public Health Region	Percent Poverty	Percent Low-Income
1	18%	41%
2	20%	46%
3	11%	27%
4	20%	44%
5	21%	45%
6	14%	31%
7	16%	36%
8	21%	44%
9	20%	43%
10	31%	58%
11	37%	62%
State Average	18%	38%

Regional data can be somewhat misleading because individual counties in a region may have much higher poverty or low-income rates than the regional average. Border counties have populations with higher percentages of poverty and low-income populations than do non-border counties. Thirty-eight percent of those living in border counties are living at or below 100% of FPL and nearly two-thirds (65%) are considered low-income.

* Rural and urban status based on definitions of the U.S. Office of Management and Budget.

Figure 2. Percent of the Population Below the 100% Federal Poverty Level (<100% FPL).



Population to Provider Ratios. Population to provider ratios were used to determine the degree of access to primary care. Only generalist physicians were used in calculating these ratios and physician data were obtained from the Texas State Board of Medical Examiners in September 2000. The practice address was used to determine physician practice location. Last year, the average ratio for the state was 1,428 persons per primary care physician. This ratio was lower in urban areas, 1,364:1, and higher in rural areas, 1,920:1. Thus, a greater degree of provider shortages occurred in rural areas than in urban areas.

Although useful for estimating shortages, ratio data must be used with caution because a county can have a sufficient supply of primary care physicians overall, and not have enough physicians serving the traditionally underserved populations, such as low-income populations.

Five public health regions had ratios greater than the state average in September 2000. Three of these regions had ratios that were only slightly higher than the state average and two had considerably higher ratios - Region 9 had a ratio of 1,798:1 and Region 10 had the highest ratio at 2,461:1. The ratios were calculated by adding the population totals for each county within a region then dividing that total by the primary care physician total for the region. Therefore there are many individual counties with significantly higher population to provider ratios than the ratio of the region as a whole. For example, in Region 11 with a ratio of 1,612:1, Starr County has a ratio of 6,458 persons for every 1 primary care physician.

The border counties had a composite population-to-primary care provider ratio higher than the state average in September 2000 - indicating a regional shortage of physicians along the border. The ratio among border counties was 2,044:1.

The minimum ratio of population-to-primary care providers that will qualify for a federal shortage designation is 3,000:1. Therefore, individual counties that have either no primary care physician or ratios of population-to-primary care physicians that exceed 3,000:1 were evaluated for this report. In six public health regions, 30% or more of the counties have either no primary care physicians, or ratios that exceed 3,000:1. Regions 1, 4, 7, 9, 10, and 11 fall into this category. Regions 10 and 11 have the highest percentage of counties with these characteristics, 37% and 50%, respectively.

According to "HMOs and Managed Care: Implications for Rural Physician Manpower Planning", [5] the recommended ratio for adequate access is 1,500:1. Because HPSA regulations require a ratio of at least 3,000:1 to be designated, this may leave significant numbers of people living in areas without an official shortage area designation because the population-to-provider ratio is between 1,500:1 and 3,000:1. Twenty-four counties in Texas (9%) have no primary care physicians, 138 counties (54%) have no pediatricians, and 158 counties (62%) have no obstetricians/gynecologists. These counties are located primarily in Public Health Regions 1, 9, and 11, as well as along the border.

Relevant TDH Activities

Activities at TDH relevant to eliminating the disparities for access to primary health care generally fall into two categories: evaluating access and improving access. These activities relate to essential public health functions one and seven. Function one involves monitoring the health status of individuals in the community, identifying community health problems, assessing health status, and data management. Function seven involves linking individuals who have a need for community and personal health services to appropriate community and private providers.

The Health Professions Resource Center (HPRC) tracks primary care providers and their location of residence and practice on a yearly basis. They also administer the HPSA designation program for the state. Another resource for determining access is the Behavioral Risk Factor Surveillance System (BRFSS) office. This office conducts telephone surveys with families across the state and gathers data related to access to primary care. The survey instrument used by the BRFSS includes specific questions about access as well as health status and health related behaviors.

The Community Health Provider Resources Program (CHPR) works with communities and providers to increase access to primary care, particularly for low-income individuals. This program works with the National Health Service Corps, a federal program that helps place physicians and mid-level providers in primary care HPSAs at sites that serve all people. This program accomplishes this activity through a scholarship program and a loan repayment program. Additionally, CHPR works with the J-1 Visa Waiver program, which helps place foreign medical graduates in rural shortage areas. CHPR also works with communities seeking HPSA designation, conducts surveys of providers for such designations, and helps connect communities to recruitment and retention benefit programs. CHPR links providers to areas in need through a matching database.

A recent CHPR project is the Robert Wood Johnson (RWJ) East Texas Rural Access Project (ETRAP). The RWJ Foundation awarded a grant to improve access to primary care in Public Health Regions 4 & 5. CHPR conducted an unmet needs analysis and looked in detail at each county in these regions. As a result, eight counties were identified that qualified for primary health care HPSA designation. Applications were prepared and submitted to the federal government. Additionally, CHPR has worked with local groups in these counties to help increase primary care providers.

One avenue for improving access to health care is the TDH Primary Health Care and Innovation grants. Proposals to improve access through research or demonstration programs are encouraged. Awards from the Primary HealthCare and Innovation grants are distributed across the state through a competitive application process.

Resources

Health Professions Resource Center Website: Contains health professions data, Health Professional Shortage Area information, and Medically Underserved Area Information http://www.tdh.state.tx.us/dpa/coverpg.HTM

Community Health Provider Resources Website: Information on the J-1 Visa Waiver Program, National Health Service Corps, Practice Sites Software, recruiting and retaining primary care providers. http://www.tdh.state.tx.us/coph /chpr.htm

Health and Human Services Commission: Data and information related to insurance, Medicaid, poverty, etc. http://www.hhsc.state.tx.us/budget/cons_bud/dssi.htm

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4. “Healthcare of Texas,” John Sharp, Texas Comptroller of Public Accounts, January 1997
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CANCER

Despite the recently reported decline in cancer mortality both in Texas and in the nation, cancer remains a serious health problem. Approximately two out of every five persons alive today will develop some type of cancer in their lifetime. In Texas, as in the United States, cancer is the second leading cause of death, exceeded only by heart disease. In the year 2001, it is estimated that 77,350 Texans will be diagnosed with cancer and 34,000 will die from the disease. The aging and growth of the Texas population will lead to increases in the numbers of new cases and deaths in the future.

The indirect and direct health care costs for patients with cancer in 1998 were $9.1 billion and $4.8 billion dollars, respectively.[1] The medical, emotional, and economic costs of cancer are staggering. The continued growth in population, the aging of the population, the increase in medical treatment expenses, and current trends in cultural and life-style behavioral risk factors that are conducive to cancer, will escalate these costs.

A critical step in decreasing the burden of cancer in Texas is to identify health disparities related to patterns of cancer incidence and mortality. The Texas Cancer Registry of the Texas Department of Health collects data on primary malignant neoplasms occurring among Texans. The principal source of case reporting for incidence data is Texas hospitals, with reports also received from radiation and surgical centers. The Texas Cancer Registry can therefore identify health disparities in both the total cancer burden, and the burden for specific cancer sites, by sex and race/ethnicity, as well as other factors.

Current knowledge and research findings.

Cancer is a group of over 100 different but related diseases, characterized by abnormal cell growth and proliferation that can occur anywhere in the body. Because there are so many diverse types of cancer, there are also a variety of risk factors associated with each. Cancer is usually not caused by only one factor; rather, it is almost always caused by a combination of factors, including life-style, heredity, and environment, which interact in ways that are not yet fully understood. Many of these risk factors are not preventable, such as age, sex, and heredity. However, many risk factors are preventable or related to personal choices, such as tobacco use, chemical, radiation and viral exposures, diet, and exercise.

While uncertainty exists regarding the ability to prevent cancer incidence, cancer mortality is certainly preventable to some degree. Early diagnosis and treatment can go a long way toward preventing many different types of cancer deaths. Many of the disparities seen in cancer mortality are likely to be related to differences in access to care and treatment, in addition to differences in cancer risk factors.

Examination of patterns in cancer incidence and mortality by race/ethnicity and sex, age, and geographical area can lead to a better understanding of reasons for the health disparities in Texas. These cancer disparities are described on a regular (annually, or more often) basis in Texas Cancer Registry publications of cancer incidence and mortality in Texas.[2,3]

To illustrate these disparities, age-adjusted incidence and mortality rates by race/ethnicity for the three leading cancer sites in Texas males and females were selected as well as total cancers (all sites combined). The leading cancer types examined included cancer of the colon and rectum and lung and bronchus cancer for both sexes, prostate cancer in males, and breast cancer in females. Cervical cancer in females was also examined since incidence and mortality from this cancer is largely preventable. There are major differences in both cervical cancer incidence and mortality by race/ethnicity.

Supporting Statistics

The discussion of race/ethnic differences in cancer incidence and mortality, and of differences in various geographical areas of Texas, is based on cancer incidence data from the Texas Cancer Registry and cancer mortality data from the Bureau of Vital Statistics. The rates of total cancer and specific types of cancer in Texas African-Americans and Hispanics were compared with rates for non-Hispanic whites, resulting in relative risk measures. The rate estimates were made using 1995-1997 statewide average annual age-adjusted incidence rates, and 1994-1998 statewide average annual age-adjusted mortality rates, all age-adjusted to the 1970 U.S. standard million population.

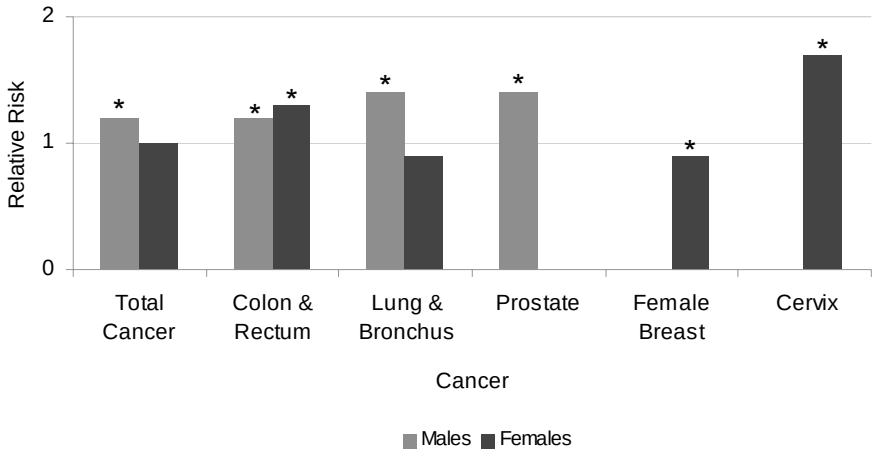
The relative risk of being diagnosed with or dying from cancer in Texas African-Americans and Hispanics compared with Texas non-Hispanic whites is shown in Figures 1–4. A relative risk of 1.0 indicates the incidence or mortality from cancer is the same in each group. If the relative risk is greater than 1.0, the cancer rate is higher in the group being studied (African-Americans or Hispanics) than in the comparison population (non-Hispanic white). If the relative risk is lower than 1.0, the cancer rates are lower in the group being studied (African-Americans or Hispanics) than in the comparison population (non-Hispanic white).

The differences between these rates were then tested for statistical significance by calculating the 95% confidence interval for the ratio of the rates and determining whether that confidence interval excluded 1.0. The 95% confidence intervals were obtained by the logarithmic transformation of the pooled rate ratio.[4]

Readers are cautioned that statistically significant variation in rates can occur for a variety of unknown factors, and additional assessment of any significant differences may be needed to determine which differences represent true public health problems. Statistical significance also does not reflect the overall importance of the result from a public health perspective (that is, non-significant differences may be important, and statistically significant differences may be unimportant).

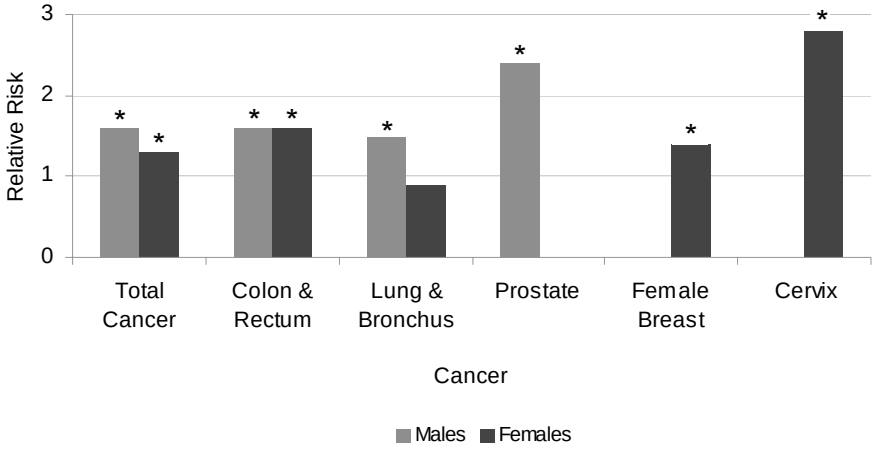
Race/ethnic differences in Texas males. The resulting patterns from these comparisons by race/ethnicity are very clear in Texas males. For each of these major cancer sites (including all cancer sites combined) Texas African-American males have consistent statistically significant higher incidence and mortality rates than Texas non-Hispanic white males (Figures 1 and 2). However, Texas Hispanic males have consistently lower incidence and mortality rates than Texas non-Hispanic white males (Figures 3 and 4).

Figure 1: Relative Risk of Cancer in African Americans Compared to Non-Hispanic Whites, Texas, 1995-1997



* Rate in African Americans is statistically significantly higher (if>1), or lower (if<1) than rate in non-Hispanics at p<0.05.

Figure 2: Relative Risk of Dying from Cancer in African Americans Compared to Non-Hispanic Whites, Texas, 1994-1998

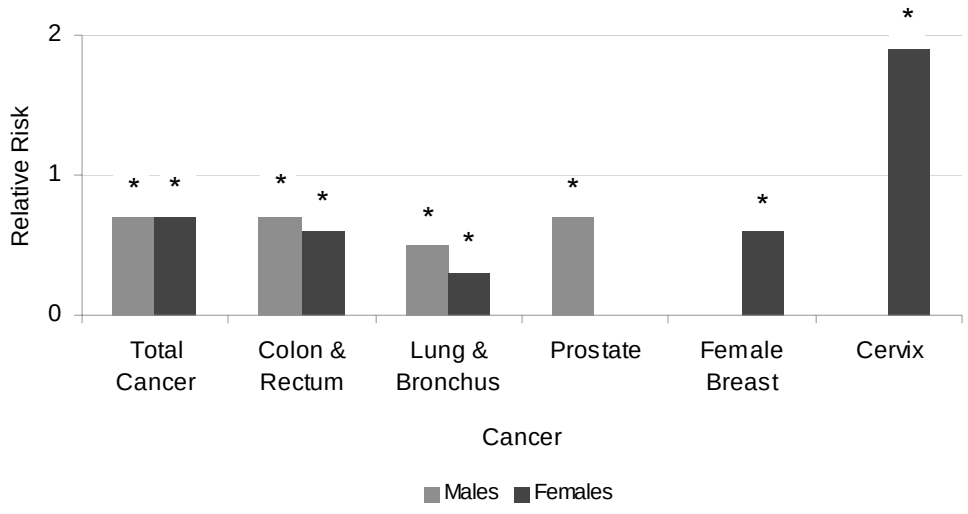


* Rate in African Americans is statistically significantly higher (if>1), or lower (if<1) than rate in non-Hispanics at p<0.05.

The differences noted for lung and bronchus cancer may be explained by differences in patterns of smoking by race. For colon and rectum cancer the reasons for the incidence differences are not as clear, though dietary factors are believed to play a role in causation of this cancer, and there may be significant differences in the dietary patterns by race/ethnicity. The reason for the significantly higher rate of prostate cancer in African-American males compared with non-Hispanic white males is unknown. However, it is particularly noteworthy that while the prostate cancer incidence difference is only about 40%, the prostate cancer mortality difference is dramatically higher at 140%. This disparity in the mortality rate could be due to a variety of factors, such as late diagnosis of prostate cancer, lack of timely and appropriate treatment, decreased overall health status, and other treatment factors.

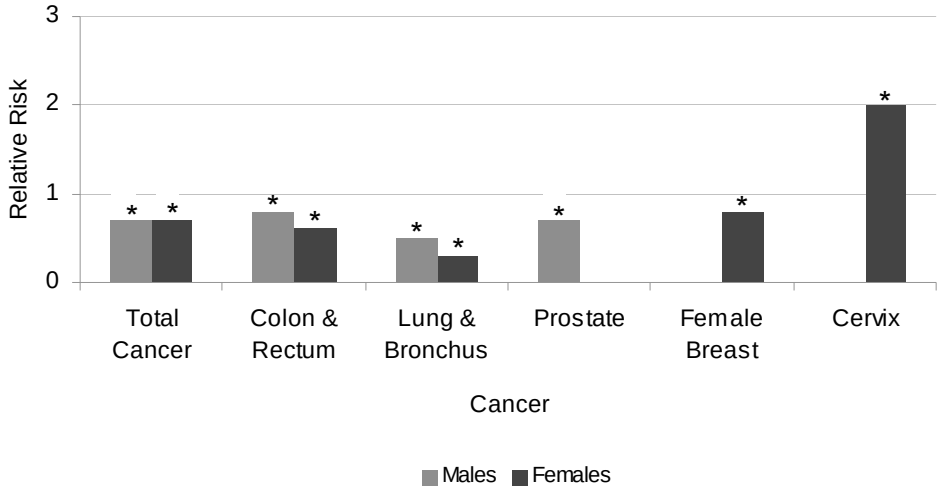
Race/ethnic differences in Texas females: The patterns in these comparisons are far less clear-cut in Texas females (Figures 1 through 4) than in Texas males. For example, total cancer incidence in Texas African-American females is the same as total cancer incidence in Texas non-Hispanic white females, and the difference in lung and bronchus cancer is lower rather than statistically significantly higher. Cancers of the colon and rectum and cervical cancer have significantly higher incidence in Texas African-American females compared with Texas non-Hispanic white females. In fact, breast cancer incidence is statistically significantly lower in Texas African-American females compared with Texas non-Hispanic white females (Figure 1).

Figure 3: Relative Risk of Cancer in Hispanics
Compared to Non-Hispanic Whites, Texas, 1995-1997



* Rate in Hispanics is statistically significantly higher (if>1), or lower (if<1) than rate in non-Hispanics at p<0.05.

Figure 4: Relative Risk of Dying from Cancer in Hispanics Compared to Non-Hispanic Whites, Texas, 1994-1998



* Rate in Hispanics is statistically significantly higher (if>1), or lower (if<1) than rate in non-Hispanics at p<0.05.

In contrast, the mortality rates for both total cancer and female breast cancer are consistently significantly higher in African-American females than non-Hispanic white females. As with prostate cancer in men, there is a major race/ethnic difference between incidence and mortality for these cancers among women. For example, while the incidence of breast cancer is significantly lower in African-American females, mortality from breast cancer is significantly higher than non-Hispanic white females. If there were no differences in the various preventable factors influencing mortality, such as early diagnosis, treatment, and overall health of the individual, then the amount and certainly the direction of the disparity should be roughly the same for both cancer incidence and mortality. This is the case, for example, for lung cancer, in which both cancer incidence and mortality are not significantly different in African-American females compared with non-Hispanic white females. However, for breast cancer, the morbidity and mortality rates diverge. This suggests major differences in early diagnosis, treatment, and other factors influencing breast cancer mortality in Texas African-American females compared with non-Hispanic white females or differences in the aggressive behavior of the disease.

The patterns of incidence and mortality differences between Hispanic and non-Hispanic white females are more consistent in that all cancer sites, with the exception of cancer of the

cervix, have significantly lower incidence and mortality in Hispanic females. The incidence and mortality of cancer of the cervix is significantly higher in Hispanic females. Again, this finding may suggest major differences in early diagnosis, treatment, and other risk factors influencing this disease.

Geographic Differences: Annual reports published by the Texas Cancer Registry provide tables detailing the incidence and mortality rates by Texas Public Health Region and by county. Differences, often large, in both cancer incidence and mortality rates occur by different geographic areas of Texas. These geographic differences are found to be proportionate to the race/ethnic distribution of the population. Thus, geographic analyses need to include race and ethnic specific comparisons within geographic areas to identify true health disparities. One finding of geographic disparities by the Texas Cancer Registry is that both cancer incidence and mortality are significantly higher in Texas urban compared with rural areas.[5] Again, the reasons for this health disparity are unknown, but the Texas Cancer Registry is an important resource providing data for further studies of health disparities in cancer.

Relevant TDH Activities

TDH engages in a variety of activities in order to address disparities related to the burden of cancer.

The Breast and Cervical Cancer Control Program (BCCCP) partners with diagnostic and treatment centers, businesses, churches and many other community-based organizations in providing screening services, improving access to services and making screening and treatment services known to area women. Each provider receiving funding works with the BCCCP State office to provide breast and cervical screening and diagnostic services at no cost to women who have low incomes and no health insurance. BCCCP specifically targets minority women.

One of six sites in the nation funded by the Centers for Disease Control and Prevention, the Texas Comprehensive Cancer Control Program (TCCCP) provides leadership for and coordination of statewide cancer control efforts. TCCCP goals consist of primary prevention, early detection and treatment, professional education, and cancer data and planning. Both TDH and TCCCP work in partnership with the Texas Cancer Council (TCC), the agency statutorily charged with developing and implementing the Texas Cancer Plan, a comprehensive blueprint for cancer control among all sectors—public, private, and volunteer. The Plan represents broad state consensus on cancer-related priorities and action steps. The numerous projects of the TCC include those devoted to breast and prostate cancer control in the Rio Grande valley, colorectal cancer in rural communities, skin cancer awareness in all Texas elementary and middle schools, and professional education for nurses, physicians, and dental professionals.

TDH has also developed an educational program designed to promote public education and awareness of prostate cancer, as well as establishing the Prostate Cancer Advisory Committee through the Bureau of Chronic Disease and Tobacco Prevention. This advisory committee works to ensure that policy makers, public health officials, health care practitioners, and all citizens of Texas are informed of the most current and accurate information on prostate cancer treatment and prevention.

The Office of Tobacco Prevention and Control (OTPC) works to reduce the health and economic toll tobacco has placed on the citizens of Texas. The major goals of OTPC are to eliminate exposure to environmental tobacco smoke, promote tobacco cessation among adults and youth, prevent initiation of tobacco use by youth, and to identify and eliminate disparities among diverse/special populations.

The Texas Behavioral Risk Factor Surveillance System (BRFSS), also addresses prevention of cancer and potential race/ethnic and geographic disparities by collecting data on lifestyle risk factors contributing to cancer and other leading causes of death and chronic disease. The BRFSS is a federally funded telephone survey conducted on a monthly basis of 1,500 randomly selected adult Texans. This surveillance is used to monitor smoking, obesity, exercise, fruit/vegetable consumption, and other cancer risk factors so that intervention priorities can be established and the long-term impact of health promotion programs can be monitored.

The Texas Cancer Registry (TCR) is a population-based registry whose goal is to collect timely and complete data on all cancer cases diagnosed in the state. The TCR analyzes cancer incidence and mortality data; disseminates cancer information and facilitates studies related to cancer prevention and control. Cancer Registry data are used to identify populations at increased risk of cancer, investigate public concerns of suspected excesses of cancer due to environmental or other factors, and monitor trends in cancer incidence and mortality so that appropriate and timely interventions are undertaken. The TCR regularly interacts and coordinates activities with other TDH programs, TDH Regions, local health departments, the Texas Cancer Council, Texas Cancer Data Center, the American Cancer Society, and other state and federal agencies (Texas Natural Resource Commission, Environmental Protection Agency, Agency for Toxic Substance Disease Registry, Centers for Disease Control and Prevention).

Resources

Breast and Cervical Cancer Control Program (BCCCP) http://www.tdh.state.tx.us/bcccp/

Texas Comprehensive Cancer Control Program (TCCCP) http://www.tdh.state.tx.us/tcccp/

Office of Tobacco Prevention and Control (OTPC) http://www.tdh.state.tx.us/otpc/

Texas Behavioral Risk Factor Surveillance System (BRFSS)
http://www.tdh.state.tx.us/chronicd/

Texas Cancer Registry http://www.tdh.state.tx.us/tcr/

Texas Cancer Council http://www.texascancercouncil.org/

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CARDIOVASCULAR DISEASE

Cardiovascular disease (CVD) was the underlying cause for 40.6% of all deaths (949,619) among U.S. residents in 1998. Heart disease was the number one and stroke was the number three leading causes of death in 1999. According to the American Heart Association, 68,800,000 Americans had one or more types of CVD in 1998. If all forms of major CVD were eliminated, life expectancy would rise by almost 7 years.[1]

Cardiovascular disease is also the leading cause of death for all ethnic and gender groups. However, African-American men and women appear to be at significantly increased risk for the disease compared to whites and Hispanics. The estimated prevalence of CVD in adults for non-Hispanic whites is 30.0% for men and 23.8% for women; for non-Hispanic African-Americans, 40.5% for men and 39.6% for women; and for Hispanics, 28.8% for men and 26.6% for women.[2] These striking differences underscore the critical need to improve screening, early detection, and treatment of CVD-related conditions for African-Americans and other high risk groups.

In addition to high mortality, CVD places a heavy burden on the nation's medical system. In 1998, CVD accounted for 62,606,000 physician office visits and 5,255,000 outpatient department visits.[3] CVD was responsible for nearly 27 billion dollars in medical payments to Medicare beneficiaries for hospital expenses in 1997.[4]

Current knowledge and research findings

Individuals with CVD tend to have multiple risk factors rather than just one. The greater the level of any single risk factor, the greater the chance of developing CVD. Each of the major risk factors—high blood pressure, smoking, and high cholesterol—adds an independent contribution to CVD risk.[5]

High blood pressure (HBP), or hypertension, is a strong risk factor for morbidity and mortality from coronary heart disease (CHD), a major form of CVD. The American Heart Association estimates that 50,000,000 Americans have HBP. People with elevated blood pressure are two to four times as susceptible to CHD as are people with normal blood pressure.

Cigarette smoking is a major cause of CVD among both men and women. Smokers have twice the risk of heart attack as nonsmokers. Smoking is also the major risk factor for sudden death from heart attack, with smokers having two to four times the risk of nonsmokers. The risk increases with the number of cigarettes smoked. Evidence also suggests that exposure to environmental tobacco smoke increases the risk of CVD by about 30% among nonsmokers who live with smokers. Thus, environmental tobacco smoke has become an important public health issue.

Diabetes Mellitus can be a major CVD contributing risk factor. Diabetics have a two to three times greater risk of CVD than non-diabetics. Further, the manifestations and outcomes of coronary events are more severe and life threatening among diabetics.

Obesity is an indirect CHD risk factor. The prevalence of high blood pressure and diabetes is three times higher among overweight people than among those of normal body weight. Obesity is associated with higher levels of total blood cholesterol and low-density lipoproteins (LDL) and lower levels of high-density lipoproteins (HDL). High levels of LDL are a leading factor in the progression of atherosclerosis and in the subsequent development of CHD.

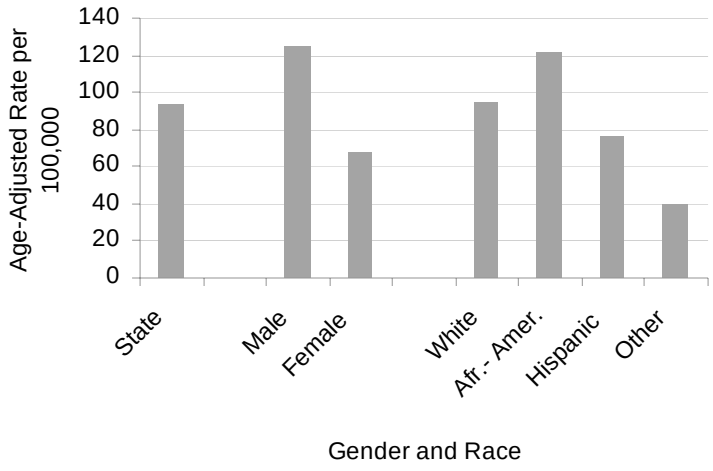
Physical inactivity is increasingly recognized as a major risk factor which has both direct and indirect effects on CVD risk. Increased levels of physical activity can increase HDL's and reduce or control obesity, high blood pressure, and diabetes. Mounting evidence suggests that even small amounts of physical activity has a significant impact on reducing the risk for heart disease mortality. According to the 1996 *Physical Activity and Health: A Report of the Surgeon General*, the protective effect of regular physical activity on CHD risk is equivalent to not smoking.

Supporting Statistics

Cardiovascular disease, the leading cause of death in Texas, accounts for more than 52,000 deaths, or nearly 37 percent of all deaths in 1998. The two most common forms of CVD, heart attack or ischemic heart disease (IHD) and cerebrovascular disease, were responsible for more deaths in every Texas county than any other cause. CVD is also a major cause of hospitalization in Texas. Over 340,000 hospitalizations for CVD alone occurred during the first two quarters in 1999, accounting for more than 33 percent of all hospitalizations during the period. More than $9 billion dollars, or $550 per Texan, was spent for treatment of heart disease and stroke.

Ischemic Heart Disease (IHD): Texas males are approximately twice as likely to die from ischemic heart disease as females (see Figure 1). African-Americans have the highest mortality risk for ischemic heart disease compared to whites, Hispanics, and other race groups. African-American deaths due to IHD were 29% higher than whites and 59% higher than Hispanics between 1994 to 1998 (see Figure 1).

Figure 1. Ischemic Heart Disease, 5-year Average Mortality Rate by Sex and Race, Texas, 1994-1998



In addition, there are considerable disparities in the burden of premature death (younger than 65 years of age) from IHD among the race groups. While 23 percent of IHD deaths among white males were less than 65 years of age, more than 36 percent of IHD deaths among African-American males and about 30 percent of IHD deaths among Hispanics were less than 65 years of age. Twenty percent of IHD deaths among African-American women were less than 65 years of age while only eight percent of IHD deaths among white women were less than 65 years of age. The darker, shaded, areas in figure 2 represent the geographic areas in Texas where mortality rates are higher than the state's 5-year average age-adjusted mortality rate of 93.3 deaths per 100,000 population based on the 1940 US standard). Counties with significantly higher mortality rates than the state's 5-year average are predominately located in the northern and eastern parts of the state. Five-year average mortality rates for border counties are lower than the state rate (77.5 per 100,000 vs. 93.3 per 100,000).

Figure 2. COUNTY COMPARISONS OF ISCHEMIC HEART DISEASE RATES
5-YEAR AGE ADJUSTED MORTALITY RATES, 1994-1998

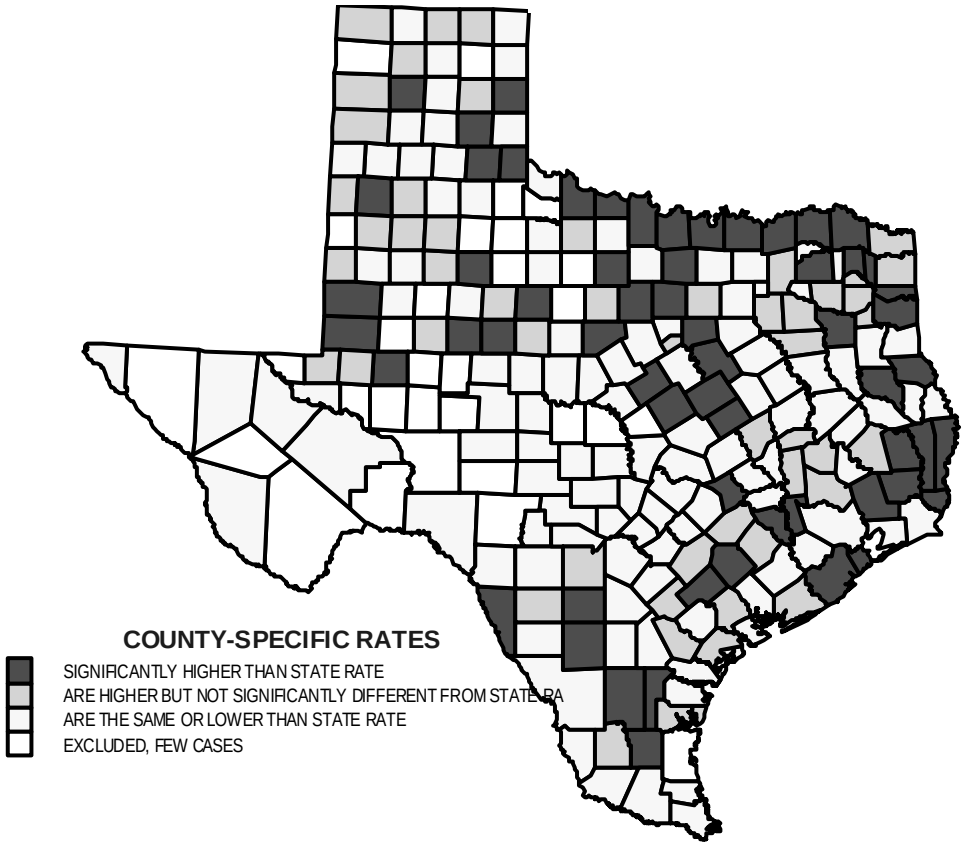
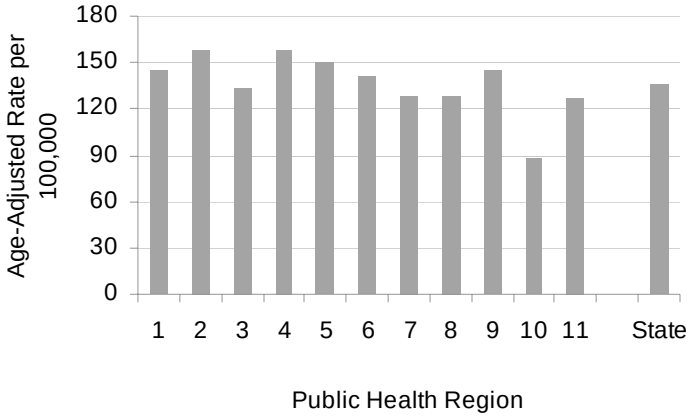


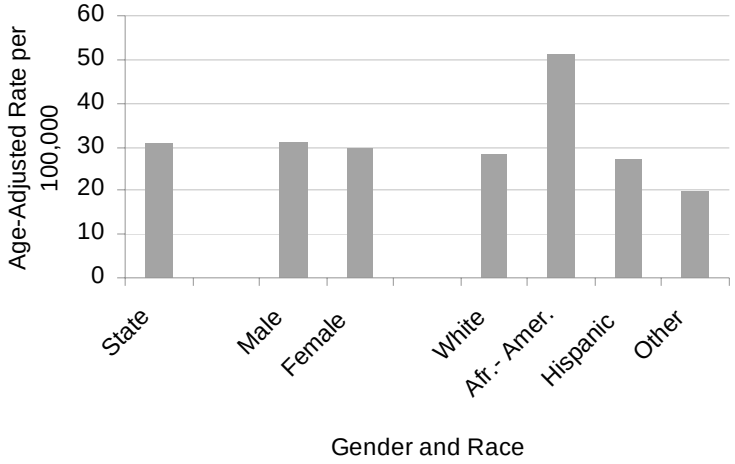
Figure 3 shows that the 5-year average age-adjusted mortality rates for ischemic heart disease for six Texas public health regions were higher than the overall 5-year average age-adjusted mortality rate for Texas. These regions include PHR 1, 2, 4, 5, 6 and 9.

Figure 3. Ischemic Heart Disease,
Texas Public Health Regions, 1994-1998



Stroke: The risk of dying due to stroke does not differ between males and females (see Figure 4). African-Americans have the highest mortality risk for stroke compared to whites, Hispanics and other race groups. Specifically, the risk of stroke was 76 and 89 percent higher for African-Americans than for whites and Hispanics, respectively.

Figure 4. Stroke, 5-year Average Mortality
Rate by Sex and Race Texas, 1994-1998



As with IHD, there are considerable disparities in the burden of premature death among individuals younger than 65 years of age from stroke by race. While 14 percent of white males who died from stroke were less than 65 years of age, about 32 percent of African-American males and about 33 percent of Hispanic males who died from stroke were less than 65 years of age.

Twenty percent of African-American women dying from stroke were less than 65 years of age while only seven percent white women were less than 65 years of age.

Figure 5 compares Texas counties with the state's 5-year average age-adjusted mortality rate (30.7 deaths per 100,000 population based on the 1940 US standard). Five-year average mortality rates for border counties are lower than the state rate (24.5 per 100,000 vs. 30.7 per 100,000).

Figure 5. COUNTY COMPARISONS OF STROKE RATES
5-YEAR AGE ADJUSTED MORTALITY RATES, 1994-1998

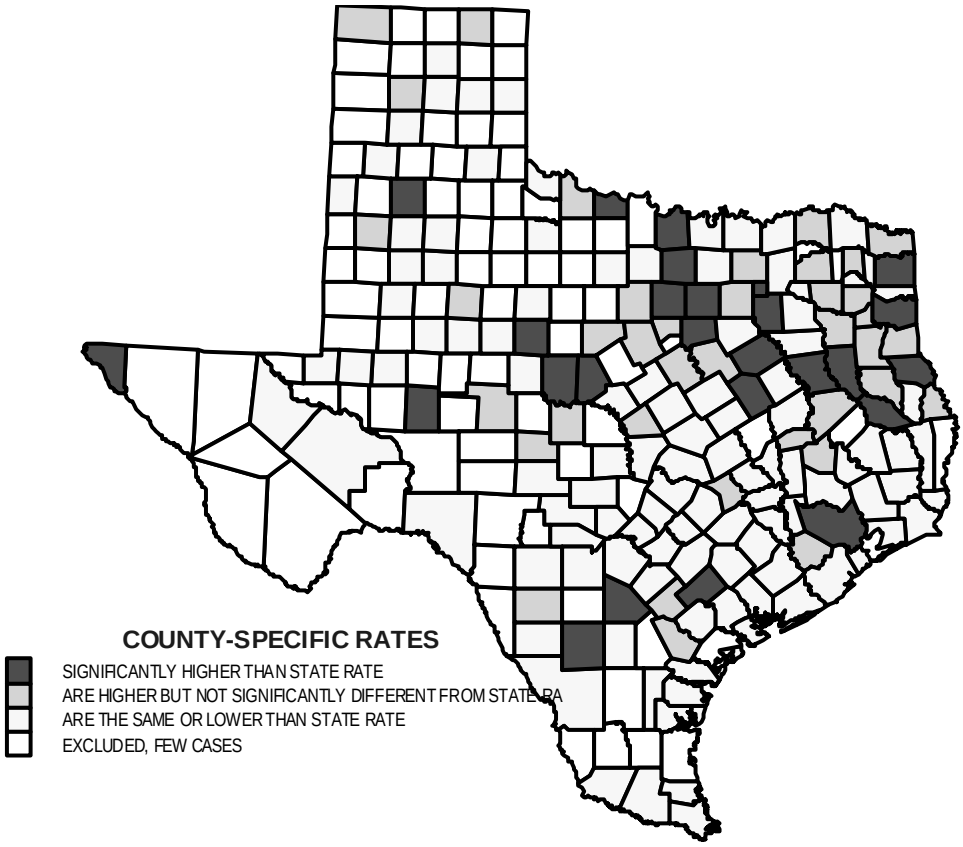


Figure 6. Stroke, Texas Public Health Regions, 1994-1998

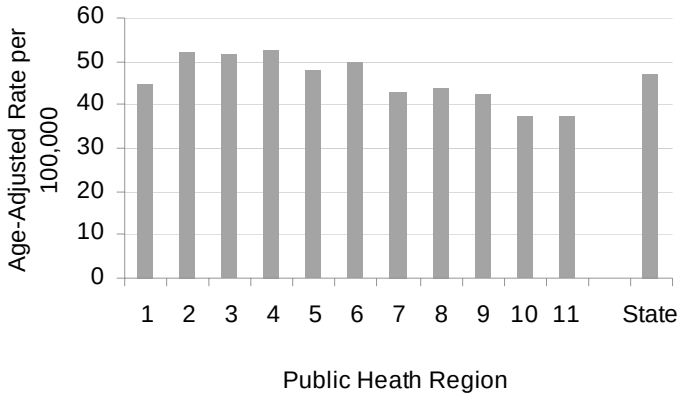


Figure 6 shows that the 5-year average age-adjusted stroke mortality rates for five Texas public health regions (PHR 2, 3, 4, 5, and 6) were higher than the overall 5- year average age-adjusted mortality rate for Texas.

Relevant TDH Activities

The Texas Department of Health addresses the risk factors for cardiovascular disease by promoting physical activity, smoking cessation, and obesity prevention through the Bureau of Chronic Disease's Office of Tobacco Prevention and Control, Community and Worksite Wellness Program (CWW), and the Diabetes Program. The Office of Tobacco Prevention and Control provides the following services; technical assistance to community organizations, schools, worksites, health professionals, and law enforcement agencies on tobacco use prevention issues; a clearinghouse of information on tobacco use prevention issues; a state-wide media campaign to educate Texans about the Texas Tobacco Law and the dangers of tobacco use; and assistance in conducting the Texas Youth Tobacco Survey which provides current data on youth tobacco use rates and trends. The Community and Worksite Wellness Program promotes increased physical activity and proper nutrition for CVD prevention through the development of policy and environmental strategies within the work, school, health care provider, and community setting. The following types of programs are promoted by the CWW Program: employee wellness programs and policies; advertisement and inclusion of healthy food options provided by food establishments, school cafeterias and vending machines; safe walking or biking paths within towns or neighborhoods; daily physical education classes and physical activity at the school level; and counseling on physical activity by health care providers. The program also provides staff support to the Texas Council on Cardiovascular Disease and Stroke. This council is charged with developing a state plan to reduce the impact of CVD and stroke in Texas. It should be completed by April 2002. The Public Health Nutrition Program offers support in the development of school and worksite wellness programs with a focus on nutrition and physical activity. The program provides baseline height and weight measurements for 4th, 8th, and 11th graders. A grant to develop a state plan to address obesity was awarded from the Centers for Disease Control in 2000 and will produce a plan by 2002. The

Office of Public Health Practice has provided innovation grants to entities to address pressing health issues. One grant funds a statewide survey on the heights and weights of children in 4th, 8th, and 11th grades. This effort will provide baseline data on the prevalence on obesity in children.

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DIABETES MELLITUS

Diabetes is the sixth leading cause of death among Texans. People with diabetes have a decreased ability either to produce or to use insulin, a hormone secreted by the pancreas that allows glucose (sugar) to enter cells and be converted to energy. In uncontrolled diabetes, glucose and fats remain in the blood and over time can damage vital organs.

Diabetes is classified into two main types. Type 1 diabetes, which most often appears in childhood or adolescence, requires insulin or other drug interventions. Type 2 diabetes, which affects 90 to 95 percent of people with diabetes, typically occurs among older adults and can often be controlled by maintaining a healthy diet, increasing physical activity, and reducing weight.

Diabetes exacts a heavy toll on society. National statistics indicate that diabetes is the leading cause of blindness in adults 20 to 74 years of age, as well as the leading cause of end-stage renal disease. More than half of lower limb amputations in the United States occur among people with diabetes. Adults with diabetes have heart disease death rates 2 to 4 times as high as those of adults without diabetes: the risk of stroke is 2 to 4 times higher in people with diabetes and 60 to 65 percent of people with diabetes have high blood pressure. Diabetes is associated with neuropathies, dental disease, and complications of pregnancy.[1] In financial terms, the estimated direct and indirect costs of diabetes in Texas in 1997 exceeded $9 billion.[2]

Among those at highest risk to develop diabetes are members of the state's growing Hispanic and Asian populations. The Texas Diabetes Institute reports that Hispanics are almost twice as likely to have diabetes as non-Hispanic whites of similar age. The burden of diabetes among African-Americans is also likely to increase. Projections indicate that the number of people with diabetes worldwide will double by 2010. Historically the most common form of diabetes—Type 2—affects middle-aged adults. However, in a disturbing trend, an increasing number of children are at risk for or are already developing Type 2 diabetes.[3]

Current knowledge and research findings

Type 1 Diabetes: Research suggests Type 1 diabetes is the result of an autoimmune disorder that gradually destroys the insulin-creating cells of the pancreas.[4] Before the clinical onset of diabetes, remaining cells will compensate by producing more insulin. But after too many cells are destroyed, the blood sugar level rises dramatically and what appears to be a sudden onset of diabetes occurs. There is no clear genetic or environmental factor, including viral illness, that appears to 'cause' Type 1 diabetes. Statistics indicate a familial risk; identical twins of a parent with Type 1 diabetes have a 25-50% greater chance of developing the condition before age 50 than twins whose parents are free of the disease. Although prevention of Type 1 diabetes is an elusive public health goal, certain tests for specific autoantibodies may identify persons at high risk for this disease. Research on products such as injected insulin or nicotinamide may one day benefit persons who are thought to be at high risk for diabetes (the presence of the autoantibodies or persons with relatives who have Type 1 diabetes).

Type 2 Diabetes: As individuals age into late adulthood, the body gradually produces less insulin or the body does not use insulin as effectively. This is sometimes called 'insulin resistance' or Type 2, diabetes. The main risk factors for Type 2 diabetes include significant overweight or obesity, especially with abdominal fat, along with physical inactivity. Generally, Type 2 diabetes develops after age 45. However, overweight youths with high insulin levels in the blood (hyperinsulinemia) are also at an increased risk for Type 2 diabetes. Type 2 diabetes has been diagnosed in higher numbers among Native American, Hispanic, African-American, and Asian populations than in non-Hispanic whites. Some studies suggest that the adoption of high fat, low fiber diets and a lack of exercise on a regular basis exacerbate the apparent genetic predispositions that influence how the body handles insulin.

According to the Centers for Disease Control and Prevention (CDC) publication, *At a Glance: Diabetes: A Serious Public Health Problem 2001*,[5] "many complications of diabetes can be prevented." Early detection, improved delivery of care, and better self-management are key strategies for preventing diabetes complications. The publication cites the following figures in its discussion of diabetes-related complications:

• *Eye disease and blindness*. Each year in the United States, an estimated 12,000–24,000 people become blind because of diabetic eye disease. Appropriate screening and care could prevent up to 90% of diabetes-related blindness. However, only 60% of people with diabetes receive annual dilated eye examinations. In the state Fiscal Year (FY) 2000, the Texas Commission for the Blind served 3,079 people with diabetes.

• *Kidney disease*. Each year, about 33,000 people with diabetes develop kidney failure, and more than 100,000 are treated for this condition. Treatment to better control blood pressure and blood glucose levels could reduce diabetes-related kidney failure by 50%. In Texas, over 45% of people served by the TDH Kidney Healthcare program in FY 2000 had diabetes.

• *Amputations*. About 86,000 people undergo diabetes-related lower-extremity amputations each year. Over half of these amputations could have been prevented by regular examinations and patient education.

Supporting Statistics

Figure 1 illustrates race-ethnic disparities in diabetes mortality based on death certificate data from the Bureau of Vital Statistics, Texas Department of Health. Mortality rates by race/ethnicity shown for 1998 were age-adjusted using the 1970 US population and represent the number of deaths per 100,000 where diabetes was listed either as an underlying cause or a contributory cause. Death rates where diabetes was the underlying cause were about two and a half times higher among African-Americans and Hispanics compared to non-Hispanic whites. Death rates where diabetes was listed as a contributory cause also indicate dramatic disparities between African-Americans and Hispanics compared to non-Hispanic whites. Statewide data for diabetes incidence is not available; mortality information from death certificates would certainly underestimate the burden of disease among the various race-ethnic groups.

Figure 1: Mortality Rates due to Diabetes by Race/Ethnicity, 1998

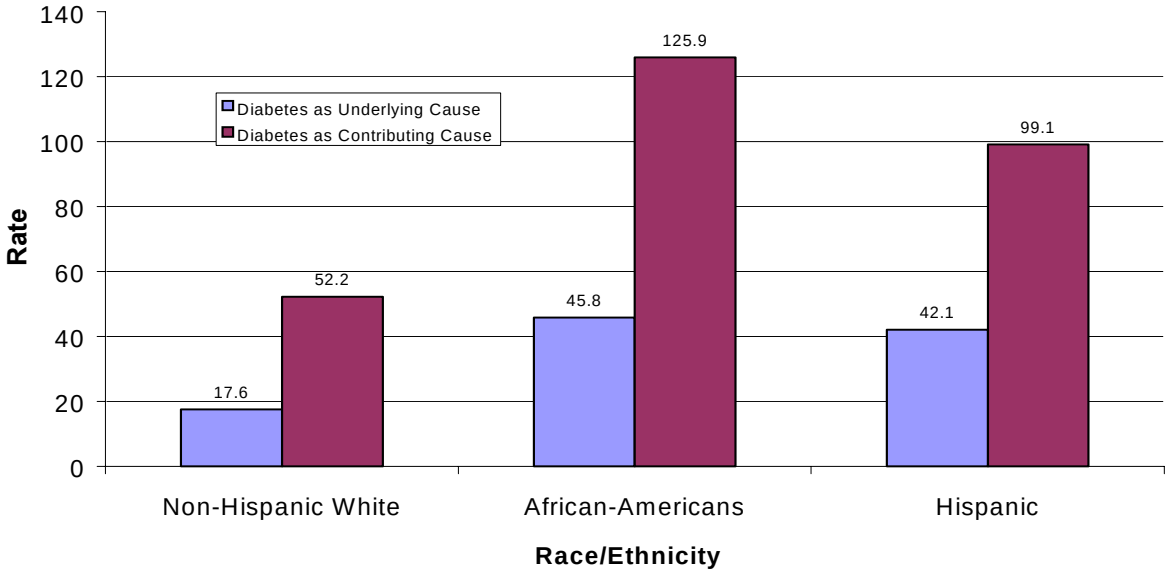
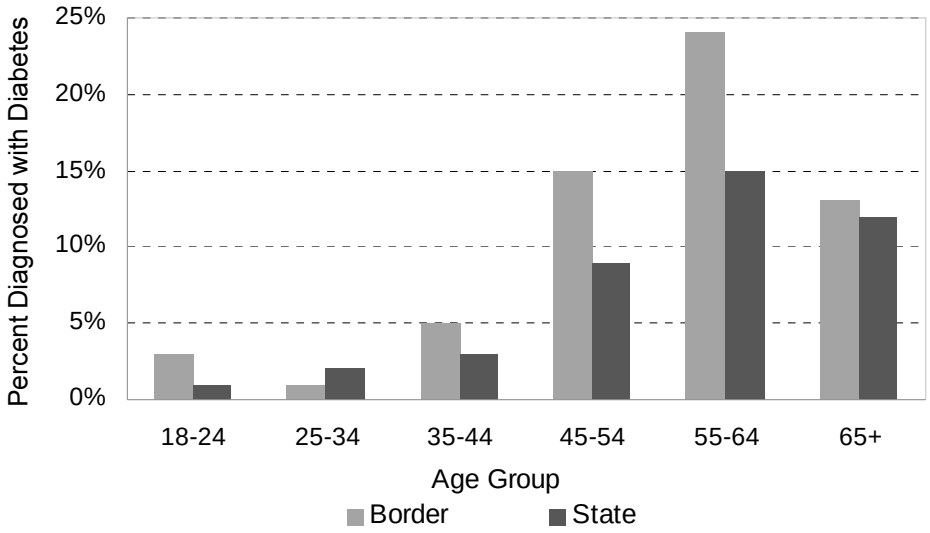


Figure 2 shows diabetes prevalence information from the Texas Behavioral Risk Factor Surveillance System, comparing age-specific prevalence between the Texas border counties to the state overall. The survey indicates that diabetes prevalence is higher for border residents compared to the state. Disparities are most pronounced for the age groups between 35 and 65. Since diabetes mortality and incidence is much higher for Mexican Americans in Texas compared to non-Hispanic whites, the border disparity in diabetes prevalence likely reflects the race-ethnic population make-up of the region.

Figure 2: Diabetes Prevalence* by Age for the State and Border Counties



*Estimated prevalence of diagnosed diabetes in Texas using 2000 Texas Behavioral Risk Factor Surveillance System (BRFSS)

Data from the TDH Kidney Health Care Program show that in FY01, 30% of the 5,000 new clients were non-Hispanic white, 42% were Hispanic, and 26% were African American. About half of all Kidney Health Care clients have complications resulting from diabetes. Hispanic clients more frequently have a primary diagnosis of diabetes (68%) than African Americans (42%) or non-Hispanic whites (42%). Among new dialysis patients, the average age of onset among Hispanic and African Americans has decreased from 54 to 52 in the last decade, while the average age of onset has increased for non-Hispanic whites from 55 to 56 years. These statistics suggest earlier onsets of end-stage renal disease among minority groups in Texas, resulting from a widening diabetes disparity.

Relevant TDH Activities

The Texas Department of Health is actively involved in diabetes prevention and control through the Diabetes Program, Bureau of Chronic Disease and Tobacco Prevention, and the Texas Diabetes Council. Described below are some of the activities of these programs.

Texas Health Care Professionals: This advisory body to the Texas Diabetes Council develops standards of care and algorithms for the treatment of individuals with diabetes. They contributed to the *Diabetes Tool Kit*, an aid for patient education distributed by the TDH Diabetes Program.

Diabetic Eye Disease Program: The Diabetic Eye Disease Program provides annual funduscopic examinations to persons with diabetes who have no insurance or other source to pay. Funduscopic examinations identify diabetic retinopathy (damage to the blood vessels in the retina) and other conditions that lead to blindness. In Fiscal Year (FY) 2000, the Texas Diabetes Council/Program helped provide eye examinations for more than 6,600 people.

Legislation: The Texas Diabetes Council, which is staffed by the TDH Diabetes Program, advises the Texas Legislature on legislation that is needed to develop and maintain a statewide system of quality education services for all persons with diabetes.

Type 2 diabetes in children and adolescents: In cooperation with public and private organizations throughout Texas, the Diabetes Program and Council have developed and published a statewide action plan and a community planning guide to address this growing problem among Texas' children. The Council is working with the Commissioner of Health to establish the new Pediatric Diabetes Research Advisory Committee for Types 1 and 2 Diabetes.

Community-based organizations: In partnership with the Centers for Disease Control and Prevention, TDH provides financial and technical support to local organizations that promote wellness, physical activity, weight and blood pressure control, and smoking cessation for persons with and at risk of developing diabetes.

Diabetes Learning Collaborative: The Diabetes Program collaborates with the Centers for Disease Control and Prevention, Health Resources and Services Administration (HRSA), Texas Association of Community Health Centers, and the Texas participating community health centers in the Diabetes Learning Collaborative. The Program enhances the Diabetes Learning Collaborative in Texas with the Capacity/Infrastructure Development (CID) program. Goals of the CID program are to improve the health status of underserved minorities in Texas and to establish the capacity and infrastructure to develop, promote, and disseminate breakthrough changes in public primary care systems for diabetes care.

Three community health centers (sites) are implementing a chronic care model with four components: 1) patient registry, 2) decision support utilizing standards of care and consistent practices, 3) delivery system redesign focusing on follow-up care rather than an acute care model, and 4) self-management to enable patients to manage their disease. All sites will develop patient registries with detailed databases to track health indicators (e.g., blood glucose levels), care delivered (e.g., eye and foot exams), and outcomes.

Public information campaign: The Diabetes Program assists the Centers for Disease Control and Prevention and the National Diabetes Education Program with its national advertising and public relations campaigns.

Continuing medical education: The Council provides physicians and other healthcare providers with continuing medical education programs that are accredited by the American Medical Association. The Program is producing a videotape to improve physician access to continuing education, particularly in rural areas.

Educational materials: The Council offers 20 publications that provide information to patients on preventing and controlling diabetes. Brochures and posters in English and Spanish are among the offerings which are available free of charge upon request. Information and guidelines also are available on the program's website (tdh.state.tx.us/diabetes/tdc.htm).

Coordinated Approach to Child Health (CATCH). Elementary school children, school staff, parents, community members, and policy makers are the audiences for this program, which is designed to increase children's physical activity levels and improve their diets at school and at home to reduce the risk for chronic disease. *Walk Texas!* promotes community-based physical activity initiatives.

Resources

American Association of Diabetes Educators: http://www.diabetesnet.com/aade.html
American Diabetes Association: http://www.diabetes.org
Centers for Disease Control and Prevention: http://www.cdc.gov/diabetes
Department of Veterans Affairs: http://www.va.gov/health/diabetes/
Health Resources and Services Administration: http://www.hrsa.dhhs.gov
Juvenile Diabetes Foundation International: http://www.jdfcure.com
National Institute of Diabetes and Digestive and Kidney Diseases of the National Institute of Health: http://www.niddk.nih.gov
Texas Diabetes Council: http://www.tdh.state.tx.us/diabetes/tdc.htm

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HIV and AIDS

Worldwide, the number of individuals infected with the human immunodeficiency virus (HIV) is estimated to be higher than ever before. Over 42 million children and adults have been infected, primarily in sub-Saharan Africa and other developing countries. The World Health Organization and the Joint United Nations Programme on HIV/AIDS estimate that 16,000 children and adults are newly infected with HIV each day. Although no complete count of new HIV infections in the United States is available, it is estimated that at least 900,000 people are infected with HIV, with 35,000 to 40,000 new infections occurring each year. Half of those affected are individuals under the age of 25.

AIDS is a specific group of diseases or conditions that result from severe immunosuppression caused by infection with HIV. The late-stage presentation of HIV disease, AIDS, reflects the prolonged severe destruction of vital immune cells that would normally generate an immune response and provide protection from invasive pathogens. In evaluating epidemiologic data, it is important to remember that data on HIV is representative of recent infections, whereas, AIDS data represents infections that may have occurred 10-18 years ago.

By the end of December 2000, 54,447 Texans had been diagnosed with AIDS since the start of the epidemic in the early 1980s. At least 29,807 of these individuals died from the disease (a cumulative case-fatality rate of 55% for Texas). Texas ranks fourth highest in AIDS cases in the US, with 2,790 AIDS cases (13.7 cases per 100,000 population) reported in 2000. Within Texas, there are pronounced disparities in HIV/AIDS by race-ethnic group and geographic regions, e.g., urban-rural. Rates of HIV/AIDS remain at epidemic levels in African-American males and in the large urban centers of Texas. Strategies to reduce these disparities must overcome longstanding societal and cultural divides. For example, distrust of government information concerning HIV/AIDS is more prevalent among African-Americans (1998 HIV Infection Testing Survey data). In addition, some people think that AIDS is now curable. Others are tired of hearing the “safe-sex” messages. Still others believe that using condoms implies infidelity.

Current Knowledge and Research Findings

Some groups are at higher risk of contracting HIV: young individuals from 13 through 24 years of age, African-Americans, men who have sex with men, intravenous drug users (IDU) and their partners, and heterosexuals who have multiple partners. HIV can be transmitted by blood or bodily fluids. HIV risk is elevated if either sexual partner has a history of sexually transmitted diseases (STDs). Transmission of HIV can be prevented, in part, by abstaining from high-risk sex (including unprotected oral sex).[1] Officials with the Centers for Disease Control and Prevention (CDC) emphasize that a much higher prevalence of HIV co-infection exists among persons with any STD than among those without STDs or a history of STDs. HIV transmission is enhanced when other sexually transmitted diseases, (ie, syphilis, gonorrhea, herpes, chlamydia), are present. Alcohol or drug use (such as crack cocaine) is often associated with riskier sexual practices.

Former Surgeon General Antonia Novello has stated that: "For teens, alcohol use is the best predictor for early sexual activity and failure to use contraception. Alcohol use, more than any other single factor, is responsible for more pregnancies, sexually transmitted diseases, and more HIV infections".[2]

Additionally, the transmission of HIV can be prevented by avoiding injection of illicit street drugs. Intravenous drug-using populations (IDUs) often share needles, cookers, and cotton filters which have been contaminated with blood, thus allowing transmission of HIV. The sexual partners of IDU's are also at increased risk of infection with HIV.

The occurrence of outbreaks of syphilis or gonorrhea internationally, and increasing HIV infections in recent months, appear to indicate a loss of concern or complacency over contracting and transmitting the virus to others. Officials warn that many people are still not accessing new medications, and risky behaviors appear to be resuming, particularly among young gay men.[3] This is of grave concern to all public health officials including the CDC which has initiated a new strategy, called SAFE (Serostatus Approach to Fighting the HIV Epidemic), to address the control of the HIV epidemic.[4]

Supporting Statistics

The rate of reported AIDS cases in 2000 among Texas' African-Americans (45.3/100,000) was more than four times higher than the rates for whites (9.2/100,000) or Hispanics (11.1/100,000, Table 1). For Texas males, the 2000 AIDS rate, (22.1/100,000) was four times higher than the female AIDS rate (5.5/100,000). The Texas male HIV rate for 2000 was 31.5 cases per 100,000 population, while the female HIV rate was 12.2 cases per 100,000 population (Table 2).

Table 1. AIDS Cases Reported in 2000 by Sex and Race *

Sex/Race	Cases	%**	Cases per 100,000 (rate)
Males			**22.1**
White	892	40	16.4
African American	704	32	63.3
Hispanic	607	27	19.0
All Others	16	<1	5.1
Females			**5.5**
White	134	23	2.4
African American	338	59	28.1
Hispanic	94	16	3.0
All Others	5	<1	1.6
Total Cases	**2,790**	**100.0**	**13.7**

* The category *All Others* includes any racial/ethnic group not listed as well as those cases not specifying race. Therefore, a rate is not calculated.
**Percentages may not total 100% due to rounding.

Table 2. HIV Cases Reported in 2000 by Sex and Race *

Sex/Race	Cases	%**	Cases per 100,000 (rate)
Males			**31.5**
White	1393	44	25.7
African American	1082	34	97.3
Hispanic	667	21	21.2
All Others	27	<1	8.7
Females			**12.2**
White	288	23	5.1
African American	754	60	62.7
Hispanic	211	17	6.8
All Others	6	<1	1.9
Total Cases	**4,428**	**100.0**	**21.8**

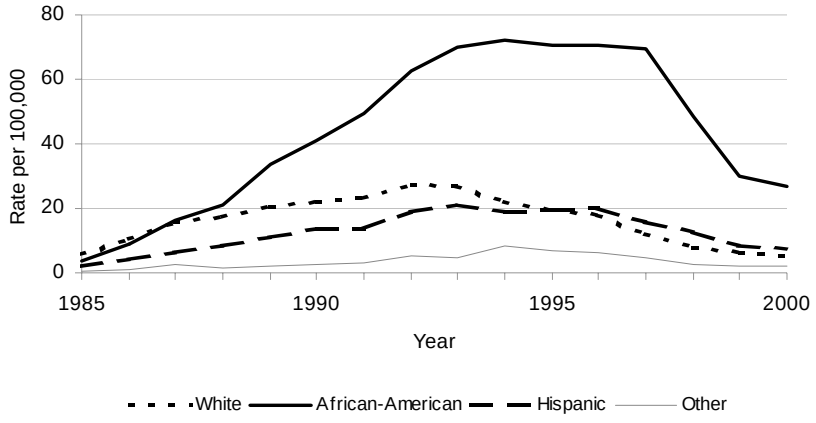
* The category *All Others* includes any racial/ethnic group not listed as well as those cases not specifying race. Therefore, a rate is not calculated.

**Percentages may not total 100% due to rounding.

Although the Texas case rate for females was 5.5 AIDS cases per 100,000, the African-American female rate was more than 5 times higher: 28.1 cases per 100,000. The Hispanic and the white female rates were lower: 3.0 cases per 100,000 and 2.4 cases per 100,000, respectively. The Texas African-American male population had the highest rate, 63.3 cases per 100,000, followed by Hispanic males at 19.0 cases per 100,000 and white males at 16.4 cases per 100,000.

Over the course of the AIDS epidemic, the disparity between African-Americans and other race-ethnic groups was at its widest in the mid 1990s (Figure 1). In more recent years, this disparity in the AIDS burden has narrowed but remains unacceptably large. For example, sixty percent of the HIV and AIDS infections among women are among African-Americans.

Figure 1: AIDS Case Rates by Race/Ethnicity, Texas, 1985-2000



HIV data clearly demonstrate the recent spread of the epidemic to females, heterosexuals, and minorities. The rate of reported HIV cases in 2000 among African-Americans in Texas (79.3/100,000) was more than 5 times higher than the rates for whites (15.1/100,000) or Hispanics (13.9/100,000). Although the Texas case rate for all females was 12.2 cases per 100,000, the African-American female rate was significantly higher at 62.7 per 100,000 (Table 2). The Hispanic and the white female rates were lower: 6.8 cases per 100,000 and 5.1 cases per 100,000, respectively. Among Texas males, African-Americans had the highest HIV rate (97.3 cases per 100,000) followed by white males (25.7 cases per 100,000) and Hispanic males (21.2 cases per 100,000).

The mode by which HIV infection is acquired varies between race-ethnic groups (Table 3). Among non-Hispanic white and Hispanic males, the majority of infections are through male-to-male sex (67% and 51%, respectively). Among African-American males, 38% of the HIV infections are through male-to-male sex. A greater proportion of HIV infections among African-American males are from intravenous drug use (IDU) compared to other groups. The primary mode of transmission among African-American (35%) and Hispanic females (48%) is through heterosexual contact. Among non-Hispanic white females, the mode of transmission is split between IDU and heterosexual contact (31% vs. 29%).

Table 3. Texas HIV Cases by Mode of Transmission, 2000

		White	%	African-American	%	Hispanic	%
Male	Male-to-Male Sex	927	67%	406	38%	339	51%
	IDU	123	9%	177	16%	62	9%
	M-M Sex & IDU	99	7%	109	10%	30	4%
	Heterosexual Contact	35	3%	112	10%	49	7%
	Blood	5	0%	2	0%	3	0%
	Not Classified	199	14%	266	25%	180	27%
	Pediatric	5	0%	10	1%	4	1%
	Total	**1393**	**100%**	**1082**	**100%**	**667**	**100%**
Female	IDU	88	31%	160	21%	29	14%
	Heterosexual Contact	83	29%	265	35%	101	48%
	Blood	0	0%	6	1%	1	0%
	Not Classified	116	40%	314	42%	79	37%
	Pediatric	1	0%	9	1%	1	0%
	Total	**288**	**100%**	**754**	**100%**	**211**	**100%**

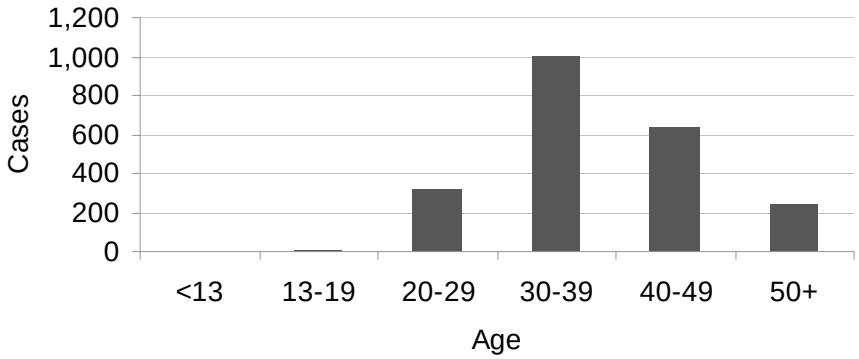
HIV and AIDS cases are still centered primarily in the larger Texas cities. In 2000, 69% of Texas AIDS cases occurred in Dallas, Bexar, El Paso, Harris, Tarrant, and Travis counties. Dallas County demonstrated the highest rate (27.1), followed by Travis County (Austin) at 26.9/100,000. Harris County rate was lower at 21.8, followed by Tarrant (12.1), Bexar (11.9), and El Paso County at 10.5 cases per 100,000 population. Travis County AIDS rates continue to outpace Harris County. Additionally, Tarrant County AIDS rates have surpassed Bexar and El Paso County rates for 2000.

With regard to HIV, Dallas County demonstrated the highest rate, (40.6/100,000), followed by Harris (38.2), Travis (37.8), and Bexar (20.5) counties. The rates for Tarrant and El Paso Counties were 17.7 and 7.1 cases per 100,000 population, respectively. The Texas Department of Criminal Justice reported 7.4% (329) of all HIV cases reported in 2000.

Both AIDS rates and HIV rates for Hispanics, whites, and African-Americans in the Texas border counties have been lower than their counterparts in the non-border counties of Texas. The African-American population traditionally has been very small in the border region.

The age group with the highest cases of HIV is the 13 to 24 year old age group. Consequently, all the symptomatology of AIDS is demonstrated most predominately in the 30 to 39 year old age group due to the lag between HIV infection and AIDS development (see Figure 2).

Figure 2: Texas AIDS Cases Reported by Age Group, 2000



Relevant TDH Activities

At TDH, the Bureau of HIV/STD addresses the surveillance, prevention and control needs for HIV and AIDS. The Bureau uses a planned process to allocate resources towards high risk groups. This process is described as follows.

Local/Regional Community Planning Groups (CPG's) throughout Texas determine the priority prevention needs (for HIV/AIDS) of the area. In Texas, HIV prevention planning is a multi-year endeavor, with 5 phases:

1. Creation of an epidemic profile
2. Needs and resource assessment
3. Creation of community-level plans, including prioritization of populations and interventions
4. Implementation of the plans
5. Update and review of the plans

First, CPGs familiarize themselves with the HIV Epidemic profile that TDH provides. This profile contains morbidity information from HARS (AIDS and HIV cases) and STD*MIS (primary & secondary syphilis, gonorrhea and chlamydia cases) and risk profiles based on HIV prevention counseling reports provided by current TDH contractors. The CPGs review this information, and develop needs assessments and resource inventories to decide needs and additional risk information about at-risk populations. Second, the CPGs use this information to

develop a plan that describes specific target populations through behavior, sex, race or ethnic group and/or age group. For each target population, the CPG identifies risk behaviors and factors that influence those behaviors, and identifies interventions that will address those risk behaviors. Third, TDH takes the Area Action Plan (AAP) and develops a Request for Proposal, reviews proposals, identifies Community Based Organizations with capacity to perform the work proposed, negotiates, and awards contracts. The agency then carries out the interventions, monitors implementation, assesses outcomes for their interventions, and refines methods for implementation, as needed based on outcome and implementation monitoring. TDH notifies the regional coordinators and field operations consultants for their review of sound documentation and final approval for operational changes.

Based on outcome monitoring and implementation issues, TDH may recommend to CPGs that additional interventions be offered or they may identify or remove additional target populations from the current plan. This then goes to the CPG for discussion and refinement of the community plan. CPGs can also determine whether new interventions and target populations are appropriate to be included in plans in future years based on continued needs assessment and resource inventory results.

There are four main objectives of community planning:

- Identify populations at risk for HIV, based primarily on risk behaviors.
- Set priorities for interventions in the populations identified above based on morbidity, risk, needs, and resources available.
- For each risk population, identify appropriate interventions based on morbidity, risk, and needs assessments.
- Set priorities by specifying interventions identified within each priority target population based on risk and needs assessments.

Community planning is key to addressing health disparities related to HIV/AIDS. Community planning begins with a comprehensive epidemiologic profile based on current data. This data-based approach necessarily identifies high priority target populations, and therefore resources are hopefully directed to those populations with the largest burdens of disease. Activity data for the year 2000 showed that among all persons counseled/tested through TDH funded sites, 25% were African-American, 34% were Hispanic, and 39% were non-Hispanic whites.

Resources

Texas Dept. of Health: http://www.tdh.state.tx.us/hivstd and http://www.tdh.state.tx.us/ epidemiology
Gay Men's Health Crisis Organization: http://www.gmhc.org
Epimonitor: http://www.epimonitor.net
Centers for Disease Control and Prevention: http://www.cdc.gov

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IMMUNIZATION

Vaccination against childhood disease is one of the most important public health interventions and is the best way to prevent unnecessary disease and death. Although Texas has been quite successful in vaccinating children entering school, the youngest and most vulnerable children still remain at risk. The *Healthy People 2010* objective for immunizations is that at least 90% of 2-year-old children be fully vaccinated with each individual vaccine and that 80% of 2-year-old children be vaccinated with four doses of diphtheria and tetanus toxoids and pertussis (DTP) vaccine; three doses of polio vaccine; one dose of measles, mumps, and rubella (MMR) vaccine; and 4 doses of *Haemophilus influenzae* type b vaccine and 3 doses of hepatitis B vaccine. For measuring improvements in the immunization coverage, the Texas Department of Health uses the 4:3:1 series (4 DTP:3 Polio:1 MMR). Except in 1995 when Texas reached the national level (76%), Texas has always ranked below the national average for vaccination rates of children 19-35 months of age. Since 1996, the Texas level has remained essentially unchanged at 75% until 2000 when the rates decreased to 70% for the 4:3:1 series.

The 30% pool of two-year old children that are not completely vaccinated threatens the health of all Texans. This is because as the number of susceptible individuals in a community increases, the ability of an organism to persist and spread within that community also increases, even to those who may have been previously vaccinated but whose immunity has waned over time. This concept of “herd immunity”, underlies the public health approach to vaccination; that is, the health of the community is increased when vaccination coverage levels are high. The best way to prevent the spread of vaccine-preventable diseases in childhood is to maintain a high vaccination coverage level in children two-years old and younger.

There are several factors that may contribute to the declining vaccination rates in the United States and Texas. Negative publicity, in most cases unwarranted, about the safety of vaccines have had a detrimental effect on immunization efforts. Contributing to the decline were the major reductions in federal funding to support state program infrastructure and initiatives. Texas experienced a 56% reduction in federal funding for program infrastructure between 1996 and 2000.

Disparities in vaccination coverage exist throughout the state, geographically and between population groups. The fundamental reasons for underimmunization are those factors related to poverty. These factors can be overcome by changing provider practices and removing financial and access barriers. Texas parents overwhelmingly believe in the importance of immunizations for their children yet may not consider that timing is important or may not know when immunizations are due. Past surveys in Texas show some subgroup differences in beliefs and attitudes. African-American parents tend to believe in natural immunity more so than other groups. Hispanic parents with strong cultural identities are far more likely to have their children immunized than more Anglicized Hispanic parents. Clients of the Women, Infant’s and Children (WIC) program perceive few barriers to immunizations and have greater trust in the health care system, while recipients of Temporary Assistance for Needy Families (TANF; formerly known as Aid to Families with Dependent Children) have more distrust. There is parental confusion about the schedule, the need for so many shots, and low awareness about immunization services. Physician focus groups in Texas reveal the prevailing

attitude that a child's immunizations were a parental rather than provider responsibility. Few physicians used effective recall and reminder systems. Evidence-based strategies to improve immunization coverage include interventions and linkages to WIC, patient and provider reminder/recall systems, provider assessments and feedback, and strategies that reduce out-of-pocket costs.

Supporting Statistics

The Centers for Disease Control and Prevention (CDC) conducts an annual vaccination survey, the National Immunization Survey (NIS), to determine the vaccination coverage level for children, 19 through 35 months of age, residing in the 50 states and territorial areas. For Texas, it provides an estimate for the state, Dallas, Bexar and El Paso counties, and for the City of Houston. However, important subgroups, such as Medicaid and TANF recipients, are not routinely included in these surveys. In addition, coverage levels by specific ages is also not available. To augment the NIS data for Texas, the Texas Department of Health has periodically conducted their own surveys to assess the vaccination status among Texas children 3 through 24 months of age. These surveys, known as the Texas Immunization Surveys (TIS), are population-based and have been conducted every two years since 1994. In this report, we present results from the TIS conducted in 1999-2000.

Table 1 shows the vaccination rates for the Texas areas included in the NIS 2000 for children age 19 through 35 months. For the 4:3:1 series, rates for counties of Bexar, El Paso, and Dallas, and the City of Houston were 68%, 72%, 69%, and 65%, respectively. Over the last decade, the City of Houston has consistently had the lowest immunizations rates of any area in Texas.

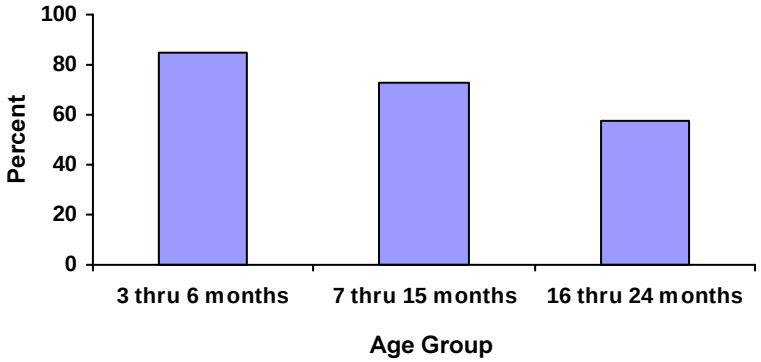
Table 1. VACCINATION LEVELS AMONG CHILDREN AGED 19 THRU 35 MONTHS, BY SELECTED VACCINES AND AREAS NATIONAL IMMUNIZATION SURVEY, 2000

AREA	4-3-1*	4-3-1-3**	4-3-1-3-3***
TEXAS	69.5%	68.5%	63.5%
BEXAR COUNTY	68.0%	67.6%	65.6%
DALLAS COUNTY	68.9%	67.1%	62.0%
EL PASO COUNTY	71.5%	69.9%	67.1%
CITY OF HOUSTON	65.4%	64.5%	60.1%
REST OF TEXAS**	70.5%	69.5%	64.0%
UNITED STATES	77.6%	76.2%	72.8%

*4 DTaP, 3 Polio, 1 MMR
**4 DTaP, 3 Polio, 1 MMR, 3 Hib
***4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 Hepatitis B
(The Healthy People 2010 objective is to increase the proportion of young children who receive all vaccines that have been recommended for universal administration for at least 5 years. The target is 80% of children aged 19 through 35 months.)
****Does not include Bexar County, Dallas County, El Paso County, and Houston, Texas.

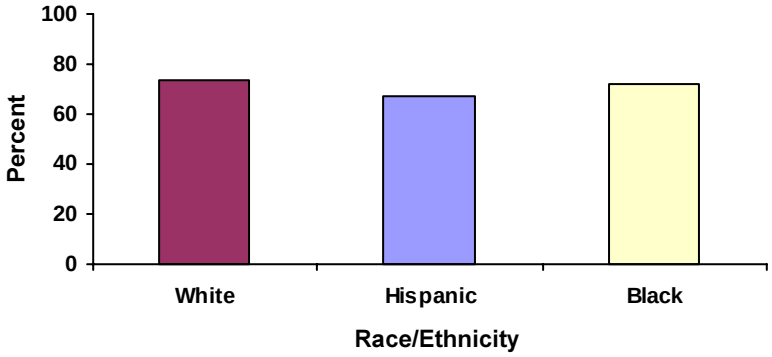
Data from TIS 2000 shows that the vaccination coverage level for children 3 months through 24 months of age was 70%. Analysis of the data by three age groups reveals that children 3 months through 6 months had the highest coverage level at 85% (Figure 1). The level then drops to 74% for children 7 months through 15 months of age and decreases even more to 58% for children 16 months though 24 months of age.

Figure 1: Percent of Texas children up-to-date on vaccinations by age group



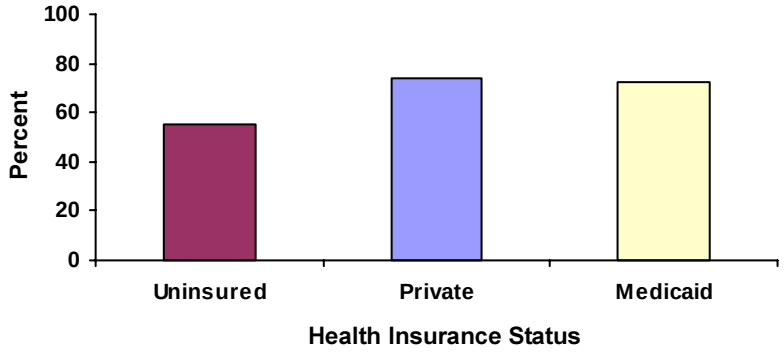
Forty-three percent of the children in the sample (n = 2,156) were white, non-Hispanic, 49% were Hispanic, 8% were black, non-Hispanic, and 3% were of another race/ethnicity. The coverage level among the state's three major racial/ethnic groups was 74% for white, non-Hispanic; 67% for Hispanic; and 72% for black, non-Hispanic (Figure 2).

Figure 2: Percent of Texas children age 3-24 months up-to-date on vaccinations by race/ethnicity



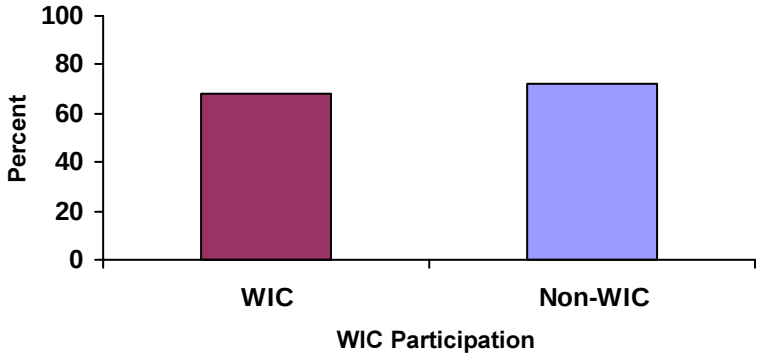
The majority of the children included in the survey had private insurance (56%). Fourteen percent of the children included in the survey had no insurance coverage, and 31% of the children were covered by Medicaid. In general, privately insured children tend to be more completely vaccinated than Medicaid or uninsured children (Figure 3). The gap between vaccination coverage levels for the privately insured and Medicaid has narrowed compared to previous TIS results, with only a two-point difference in this latest survey (74% and 72%, respectively). The coverage level for uninsured children was relatively low at 55%.

Figure 3: Percent of Texas children age 3-24 months up-to-date on vaccinations by health insurance status



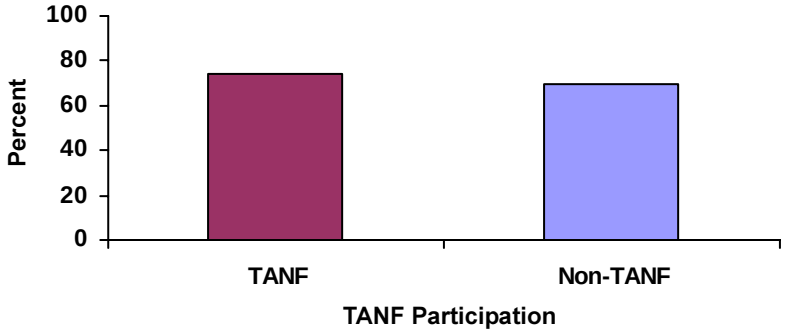
Forty-four percent of the children surveyed participated in the Supplemental Nutrition Program for WIC. The vaccination coverage level for children participating in WIC was 68% compared to 72% for non-participating children (Figure 4).

Figure 4: Percent of Texas children age 3-24 months up-to-date on vaccinations by WIC participation



Only 3% of the children surveyed received benefits from TANF. The vaccination coverage level for children receiving TANF was 74% compared to 70% for children not receiving TANF (Figure 5).

Figure 5: Percent of Texas children age 3-24 months up-to-date on immunizations by TANF participation



The sample size was sufficient to estimate coverage levels for 10 priority counties in Texas (Table 1). The vaccination coverage levels vary greatly among the ten counties. Travis, Tarrant, and Potter had the highest coverage levels (74%, 73%, and 72% respectively), while El Paso County had the lowest level at 59%.

Table 1: Percentage of children 3 through 24 months of age up-to-date on vaccination by county

County	Percent	N
Bexar	67	202
Dallas	69	185
El Paso	59	203
Harris	69	168
Hidalgo	66	212
Nueces	65	211
Potter	72	205
Smith	67	171
Tarrant	73	186
Travis	74	176

In summary, the year 2000 statewide population-based telephone survey of children 3 months through 24 months of age revealed a vaccination coverage level of 70%. Results from the survey also identified under-vaccinated areas and subgroups that require special efforts for Texas to achieve the *Healthy People 2010* goals. Children covered by private insurance and or Medicaid, children receiving TANF, and children residing in Travis, Tarrant, or Potter counties had higher vaccination coverage levels. Lower coverage levels were observed among Hispanics, children on WIC, and uninsured children.

Relevant TDH Activities

The Immunization Division of the TDH has numerous ongoing activities which address the low vaccination coverage levels in the state. An Immunization Action Plan was developed in May 2000 and efforts are underway to improve vaccination coverage in Texas. Initiatives to increase the number of providers participating in the Texas Vaccines for Children (TVFC) program have been implemented. A provider tool kit has been developed which contains information on the TVFC program, school immunization requirements, recommended immunizations, vaccine safety, the statewide immunization registry, proper vaccine administration site, vaccine storage, and record keeping. Statewide site visits by TDH include assessment of vaccination coverage and level and solicit feedback from providers on how to improve these levels.

An integral component of a successful immunization program is a comprehensive statewide immunization registry. The registry provides recall and reminders to providers and parents for children who are either due or past due for their vaccinations. A fully functional and populated registry can provide data to identify high-risk and under-vaccinated populations. The staff of the Texas immunization registry, ImmTrac, is conducting outreach activities to educate private providers; schools and child care centers about the registry and its benefits. These efforts are being done to increase participation in the registry in the hopes of achieving a more

populated registry. A project is being conducted in collaboration with the Texas A&M University to identify methods to allow communities to assess their vaccination coverage levels.

These assessments will help target resources to areas with the most need. Collaborations with immunization coalitions composed of community leaders, parents, providers, non-profit organizations, local health departments, and corporate partners, organize activities to target pockets of need to ensure the timely vaccination of children in their community. The coalitions organize immunization campaigns that target specific areas in their community to ensure that children are vaccinated at specific times of the year, such as during National Infant Immunization Week, and back-to-school initiatives.

Another program aimed at improving vaccination coverage levels is the Retired Seniors Volunteer Program (RSVP). Seniors in various communities participate in the Senior Volunteer for Childhood Immunizations (SVCI) and educate parents at the time of the birth of their child about the importance and need for timely immunizations. The RSVP group works with hospitals in their community where they visit the mothers of newborn children before they leave the hospital. During the visit they enroll the mother in the SVCI program, who then receives reminders of the next immunization that her child needs.

Collaborations and partnerships exist with the Parish Nurses Program throughout the state to target faith-based organizations to educate parents on the need for immunizations. Each parish nurse serves as the health minister of that congregation, and immunizations are a part of their health focus. Negotiations with the corporate office of a large discount chain are in progress to identify the best strategies to address the immunization need in the state. All of these approaches are aimed at improving the vaccination coverage levels of Texas children.

Resources

Centers for Disease Control and Prevention. National, state, urban area vaccination coverage levels among children aged 19-35 months—United States, 1999. Morbidity and Mortality Weekly Report. Vol. 49, No. 26, pg. 585-589, 7 July 2000.

The Center for Disease Control and Prevention. National Immunization Survey. http:// www.cdc.gov/nip/coverage.

The Texas Department of Health. Texas Immunization Survey. http:// www.tdh.state.tx.us immunize/irstate.htm

INFANT MORTALITY

The infant mortality rate (IMR), defined as the number of deaths to infants less than one year of age per 1,000 live births, is an important and longstanding indicator of the overall health of a community. Infant mortality serves as a composite indicator of the quality of, and access to, medical care for pregnant women and infants.

The leading causes of death associated with infant mortality are 1) congenital abnormalities, 2) disorders relating to length of gestation (including low birth weight), 3) maternal factors and complications of pregnancy, labor, and delivery, 4) respiratory distress, and 5) sudden infant death syndrome (SIDS). The majority of infant deaths occur in the neonatal period (first 27 days of life) and are due to congenital abnormalities, prematurity, or low birth weight. The leading causes of death are similar across race/ethnic groups, but their relative contribution to infant mortality among these groups varies.

Between 1991 and 1999, the IMR declined, on average, 2.5% per year. Larger average annual declines of 4% occurred between 1980 and 1990. Despite these declines, disparities in infant mortality persist, and in some instances have grown wider among maternal race/ethnicity groups, maternal age groups, and geographic areas. For example, from 1989 -1999 African-American infants, on average, died at a rate twice that of all other infants born in Texas (Figures 1 and 2). Further, this disparity has steadily grown wider since 1997.

Figure 1: Infant Mortality Rate
Texas Residents, 1997-1999

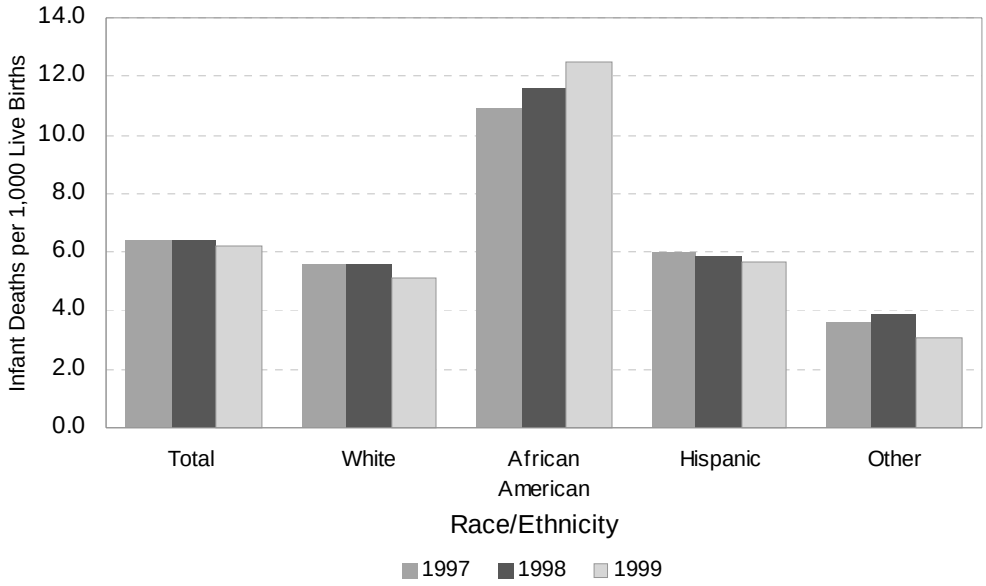


Figure 2: Infant Mortality
Disparity Between African American and White Rates

The majority of 1999 infant deaths (63%) in Texas occurred during the first 27 days of life—the neonatal period. The rate of post-neonatal deaths (deaths occurring after the 28th day, but before the infant's first birthday) also significantly contributes to the overall infant mortality rate. Among Texans, disparities in infant mortality can be illustrated by noting that:

- The 1999 neonatal death rate for African-Americans (7.8 infants per 1,000 live births) was over twice that of whites (3.2). Hispanics had the second highest neonatal death rate (3.7).
- The post-neonatal death rate of African-Americans (4.8 infants per 1,000 live births) was nearly two and a half times that of Hispanics (2.0) and Whites (1.9).

Neonatal Mortality

The three leading causes of neonatal infant mortality in Texas during 1999 were 1) congenital abnormalities (25% of neonatal deaths), 2) low birth weight (20%), and 3) maternal factors and complications of pregnancy, labor, and delivery (14%).

Congenital Abnormalities: Approximately 10,000 Texas babies are born each year with one or more major structural malformations. Heart defects are the most common type of birth defect. The overall infant mortality rate due to congenital abnormalities was highest among African-Americans (1.6 deaths per 1,000 live births), followed by Hispanics (1.4), whites (1.2), and other race-ethnic groups (0.4).

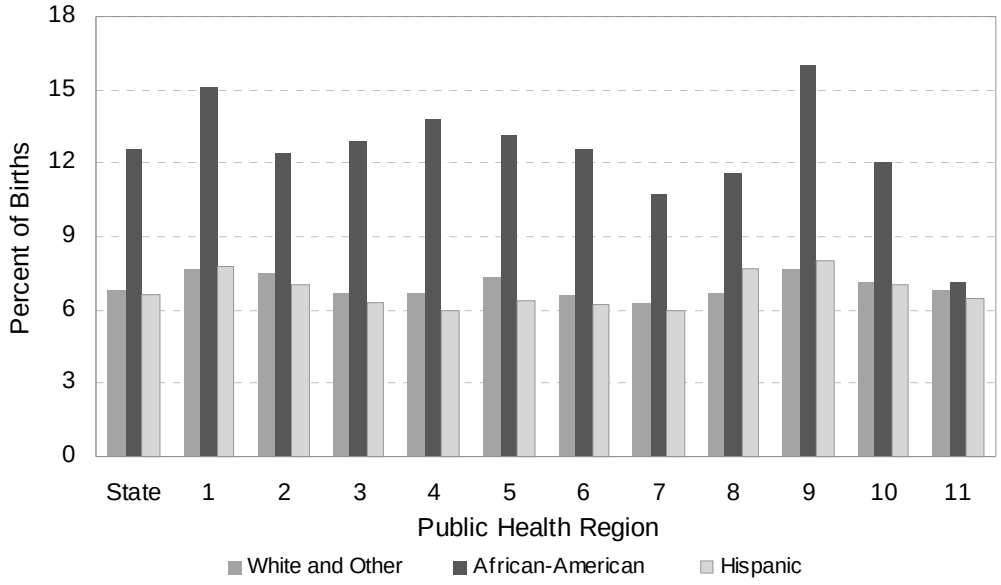
Although the causes of most birth defects remain unknown, non-genetic external factors such as drugs, alcohol, poisons, and some illnesses in a pregnant mother can affect fetal development. Good nutrition and vitamins help to prevent certain birth defects. For example, research suggests that supplementation of the diet of childbearing women with folic acid, a B vitamin, can prevent some neural tube defects such as spina bifida and anencephaly. Research suggests that mothers younger than 20 years of age have the highest rates of anencephaly and spina bifida.[2]

- Anencephaly rates in 1999 were lowest in African-Americans (7.5 per 100,000 live births) and highest in Hispanics (12.7 per 100,000 live births), especially among Hispanics that live on the Texas-Mexico border.

- The proportion of neonatal deaths due to congenital abnormalities among Hispanics in 1999 was nearly 29%, whites was 28%, and African-Americans was 14.5%.

Low Birth Weight (LBW): Despite the overall declines in infant mortality, an increased number of low birth weight (less than 5 pounds, 9 ounces) babies are being born in Texas. Over the past ten years, LBW infants have increased from 7.0% to 7.4% of live births. While at-risk premature infants now have a greater likelihood of survival due, in part, to advancements in perinatal care and ventilation techniques, disparities in low birth weight remain. In 1999, the risk of giving birth to a LBW infant was much higher among African-American mothers (12.6%) than for Hispanic mothers (6.7%) or white mothers (6.8%). East Texas (Public Health Region 5) had the highest incidence of low birth weight infants (Figure 3).

Figure 3: Low Birth Weigh (<5 lbs. 9 ozs.) Infants
Texas Residents, 1999



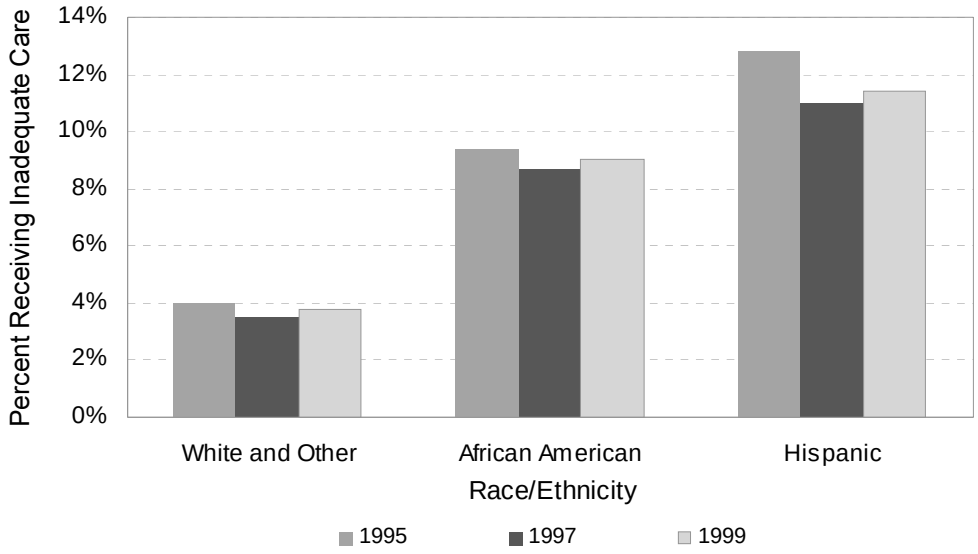
Maternal age is a risk factor for LBW. Women under 20 or older than 40 are the most likely to have low-birth weight babies. In 1999, 21.2 % of births to mothers age 19 and younger and 10.9 % of births to mothers age 40 and over were low birth weight. Nearly 22% of African-American births and 20% of Hispanic births were to mothers 19 years of age or younger, compared to 10.6 % of white births. While African-Americans and Hispanics were more likely to give birth at young ages, white women were more likely to become mothers at older ages.

A total of 4,526 births in 1999 (1.3% of live births) weighed less than 1,500 grams. As with LBW, the risk of having a very low birth weight infant was highest for African-American mothers and for mothers age 14 years or younger and over 40 years.

Prenatal Care or Other Maternal Factors

A major risk factor for low birth weight (and infant mortality) is the timing and quality of prenatal care. Prenatal screening and intervention for high-risk groups, particularly African-American women, is critical in reducing ethnic disparities in infant mortality. The Kessner Index, used to rate the adequacy of prenatal care, is based on the trimester that care began, the number of prenatal visits made, and the length of gestation (Figure 4).

Figure 4. Percent of Women Receiving Inadequate Prenatal Care*
Texas Residents, 1995-1997



*According to the Kessner Index

Hispanics are the most likely to receive inadequate prenatal care in Texas. When examined by geography, Hispanics in Public Health Regions 10 and 11 were the least likely to receive adequate prenatal care. However, African-Americans in Public Health Regions 1, 4, 5, 8, and 9 were less likely than Hispanics to receive adequate prenatal care. Despite having a high proportion of teen births and limited access to prenatal care, Hispanics consistently had better birth outcomes than African-Americans. The socio-cultural or biological factors underlying this trend remain unknown.

Post-neonatal Mortality

The leading causes of post-neonatal deaths (which comprise 36.9% of all infant deaths in Texas) are sudden infant death syndrome, congenital abnormalities, and respiratory distress.

Sudden Infant Death Syndrome (SIDS): SIDS is a diagnosis that is used only when the cause of an infant death remains unexplained after a thorough investigation. Investigations, although inconclusive, often point to brain abnormalities, cardiovascular and respiratory failure.[3,4] SIDS is more common among low birth weight infants. Twenty-three percent of post-neonatal deaths in 1999 were due to SIDS.

Note the following disparities:

- African-American infants were more than twice as likely to die from SIDS (140.0 deaths per 100,000 live births) than either white (61.3) or Hispanic Infants (36.2).

- There was a greater than 30% decline in the rate of SIDS among whites and Hispanics from 1997 to 1999. For African-Americans, however, the infant mortality rate due to SIDS increased by two percent.

Respiratory Distress: Nine percent of the post-neonatal deaths that occurred in 1999 were due to respiratory distress of newborns. Prematurity, a risk factor for respiratory distress, occurred more frequently among Hispanic infants. Forty-nine percent of the 71 post-neonatal infant deaths that occurred in 1999 as a result of diseases of the respiratory system were Hispanics. Twenty-seven percent were African-American infants and 21% were white. While African-Americans were twice as likely as Hispanics to have LBW infants, Hispanics were twice as likely as African-Americans to have had infants with respiratory distress.

Relevant TDH Activities

The 1999 infant mortality rate in Texas of 6.2 remains lower than the national average of 7.3 and is already below the *Healthy People 2010* goal of 7.0. Despite these favorable numbers, African-American infant mortality has not declined as rapidly as non African-American groups. To further reduce infant mortality among all Texans, we must better understand the underlying and unexplained factors that create these disparities, through continued epidemiological and behavioral research. From this research, we should develop more effective programs which intervene on behaviors such as smoking, substance abuse, poor nutrition, psychosocial problems such as stress and domestic violence, and lack of prenatal care—factors known to influence the risk of infant mortality.

The Texas Department of Health has administered the Title V Maternal and Child Health program since the implementation of the Federal Social Security Act of 1939. The Associateship for Family Health (AFH) is the primary TDH program charged with developing a comprehensive strategic plan to improve the reproductive, maternal, and child health of Texans. Priorities established by AFH align closely with the agency mission and with national objectives set forth by both *Healthy People 2010* and the Federal Bureau of Maternal and Child Health. TDH-wide activities are designed and implemented to meet these objectives and ultimately to address the state's reproductive, maternal, and child health priorities. These activities focus on infrastructure development, including the maintenance of data and planning systems at the state level. Services are provided through a coordinated effort with regional public health clinics, local health departments, community health centers, medical schools, and other contractors. TDH maternal and infant health programs encompass varying health services, including maternity services, family planning services, child health services, vision and hearing screening, newborn screening, and genetics screening and counseling. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the largest service delivery program at TDH, provides education and training in nutrition and breastfeeding, and nutritional foods to low-income families.

Texas is enhancing its surveillance of perinatal outcomes and risk factors. Through specific monitoring and surveillance activities, the Texas Perinatal Regionalization Program, mandated by Texas legislation, will assure reasonable access to safe and appropriate perinatal services and improve the quality of care by encouraging optimal use of health care resources. The Pregnancy Risk Assessment Monitoring System (PRAMS) will complement this effort by providing necessary data on the prevalence of risk factors and the effects of these risk factors on the health of Texans.

TDH efforts to reduce preventable congenital malformations are under the purview of the Texas Birth Defects Monitoring Division. Division activities include an active surveillance system to collect extensive information on the prevalence of birth defects. This division of the Bureau of Epidemiology came into existence as a result of legislative concerns regarding an early 1990's cluster of neural tube defects that occurred in Cameron County. Preventive activities related to birth defects are further described in the Neural Tube Defects chapter.

Resources:

Texas Department of Health. Survey of Health and Environmental Conditions in Texas Border Counties and Colonias: Executive Summary. Office of Border Health. Available at http://www.tdh.state.tx.us/border/bhpubs.htm. 2000

Texas Department of Health. "Texas Pregnancy Risk Assessment Monitoring System (PRAMS): Application for Funding," CDC Program Announcement 01010, CFD 93.283.2000

Texas Department of Health. Red Voices: American Indian Health Indicators: Special Report. Texas' Fifth Minority Health Conference: Are We Closing the Gap? Austin: Red Lion Hotel, Dec. 2-4. 1997

Centers for Disease Control. Opportunities to Reduce Maternal and Infant Mortality Morbidity and Mortality Weekly Report 48 (38): 856. 1999

Centers for Disease Control. Use of folic acid for prevention of spina bifida and other neural tube defects: 1983–1991. Morbidity and Mortality Weekly Report 40:513-516. 1991

National Center on Congenital Abnormalities and Developmental Disabilities. Available on the web at http://www.cdc.gov/ncbddd/bd/default.htm

Healthy People 2010 http://www.health.gov/healthypeople/Publications/

DATA 2010 http://wonder.cdc.gov/data2010/WONDER.CDC.GOV/DATA2010

DATA 2010 is an interactive database system developed by staff of the Division of Health Promotion Statistics at the National Center for Health Statistics and contains the most recent monitoring data for tracking Healthy People 2010. Data are included for all the objectives and subgroups identified in the Healthy People 2010: Objectives for Improving Health. DATA 2010 contains primarily national data. However, state-based data are provided as available.

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U.S. Department of Health and Human Services. The Initiative to Eliminate Racial and Ethnic Disparities in Health. 1998 Available from http://raceandhealth.hhs.gov/ 1998 Kerr GR, Ying J, Spears W., Ethnic Differences in Causes of Infant Mortality: Texas Births, 1989 through 1991. Texas Medicine. Dec. 91(12): 7. 1995

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Stratton, K.; Howe, C.; Battaglia, F.; eds., Fetal Alcohol Syndrome: Diagnosis, Epidemiology, Prevention, and Treatment. Washington, DC: National Academy Press. 1996

Marian F. MacDorman, Jonnae O., and Atkinson, M.S. Infant Mortality Statistics from the 1996 Period Linked Birth/Infant Death Data Set, Monthly Vital Statistics Report Vol. 46, No. 12, Supplement. August 27. U.S. Department of Health & Human Services. Centers for Disease Control and Prevention/National Center for Health Statistics. 1998

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1. Texas Department of Health *Perinatal Mortality in Texa*s. Bureau of Vital Statistics. Publication No. 35-10352. 1997
2. Canfield, M., *The Prevalence and Patterns of Neural Tube Defects in Texa*s. Proceedings Of The Texas Birth Defects Conference. Houston. 2000 Available at http://www.tdh.state.tx.us/tbdmd/proceedings.htm
3. McGaughey PJ, Starfield B., Alexander C, & M.E. Ensminger “Social Environment and Vulnerability of Low Birthweight Children: A Social-Epidemiological Perspective, ”*Pediatrics* 88: 943-53., 1991.
4. Sudden Infant Death Syndrome Alliance: Available from : http://www.sidsalliance.org/Research/default.asp.

NEURAL TUBE DEFECTS

Neural tube defects (NTDs) are a group of birth defects that arise from the failure of the neural tube to develop properly during the embryonic stage. The major types of NTDs are anencephaly, spina bifida, and encephalocele. Anencephaly, which always results in stillbirth or the death of the newborn, is characterized by the absence of portions of the skull, with the cerebral hemispheres completely missing or reduced to small masses attached to the base of the skull. Spina bifida is the defective closure of the bony encasement of the spinal cord through which the cord and meninges may or may not protrude. Encephalocele is the protrusion of some or all of the brain through a defect in the skull. It is estimated that one baby is born every day in Texas with a neural tube defect.

Spina bifida, the most common NTD, can be a devastating birth defect. In severe cases, the spinal cord protrudes through the back and may be covered by skin or a thin membrane. Surgery to close a newborn's back is generally performed within 24 hours after birth to minimize the risk of infection and to preserve existing function in the spinal cord. However, because of the potential of paralysis that may occur from damage to the spinal cord, people born with spina bifida may need multiple surgeries and other extensive medical care. The condition can also cause bowel and bladder complications. A large percentage of children born with spina bifida also have hydrocephalus, the accumulation of fluid in the brain. Hydrocephalus is controlled by a surgical procedure called "shunting" which relieves the fluid build up in the brain by redirecting it into the abdominal area. Most people affected by spina bifida live well into adulthood after receiving corrective surgery.

There are racial/ethnic differences in risk for NTDs.[1,2,3] In the United States, NTD prevalence has been reported to be highest among Hispanics, followed in descending order by non-Hispanic whites, Native Americans, African-Americans, and Asians. Differences in racial/ethnic rates may be due to differences in genetic susceptibility to NTDs, cultural behaviors, diet, or some other factor. There also appear to be disparities by geographic location, even when taking racial or ethnic makeup of those areas into account.

Current Knowledge & Research Findings

Research has clearly demonstrated that folic acid (a B vitamin), consumed by the mother prior to conception, may prevent as many as 75% of all neural tube defects.[4] In 1992 the U. S. Public Health Service (USPHS) recommended that all women of childbearing age consume 0.4 mg (400 micrograms) of folic acid daily to reduce the risk of spina bifida and anencephaly.

Exactly how folic acid prevents NTDs is not clear. Folic acid may not reduce NTD risk to the same degree in all racial/ethnic groups,[5,6] suggesting that a genetic component may be involved; research is continuing in this area. Recent investigations have indicated that the influence of folic acid use may relate to defects in homocysteine metabolism.[7] Maternal metabolic defects[8] or exposure to certain medications[9] can cause low folate levels, possibly creating greater need of folic acid supplementation.

Other nutritional factors, such as inadequate periconceptional intake of vitamin B-12, methionine (an amino acid),[10] and zinc[11] may increase NTD risk. The lack of these nutrients in the diet may also indicate poor nutritional status, associated with poverty which increases the risk of poor infant health outcomes.

Besides nutritional deficiencies, other risk factors for NTDs have been identified. Maternal obesity has been linked to increased NTD rates,[12] and women with diabetes are known to be at increased risk for having an infant with a birth defect. One study has reported that maternal psychosocial or emotional stress during pregnancy may increase the risk of having an infant with an NTD.[13] Medications used to treat epilepsy (which act as folic acid antagonists) have been found to increase risk of spina bifida.

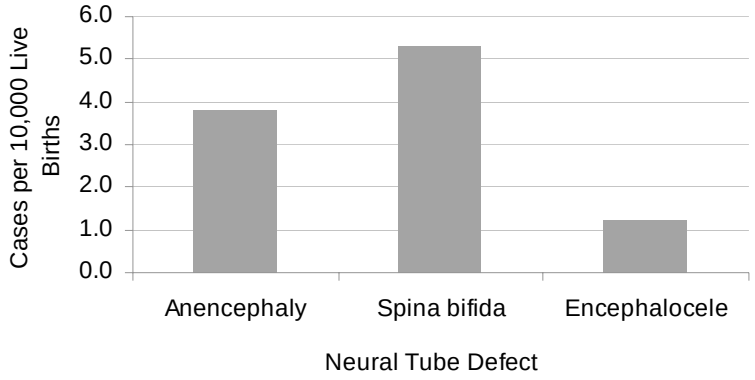
Living in proximity to hazardous waste sites and agricultural crops has been reported to increase NTD risk, as have drinking water contaminants.[14,15] A recent study found an increased risk of anencephaly, but not spina bifida, with exposure to nitrate in drinking water.[16]

Mothers who have had a prior pregnancy affected by an NTD are at a much higher risk for NTDs in subsequent pregnancies. However, studies done in Texas have demonstrated that a very high dose of folic acid before the next pregnancy is very effective in preventing a recurrence.[17]

Supporting Statistics

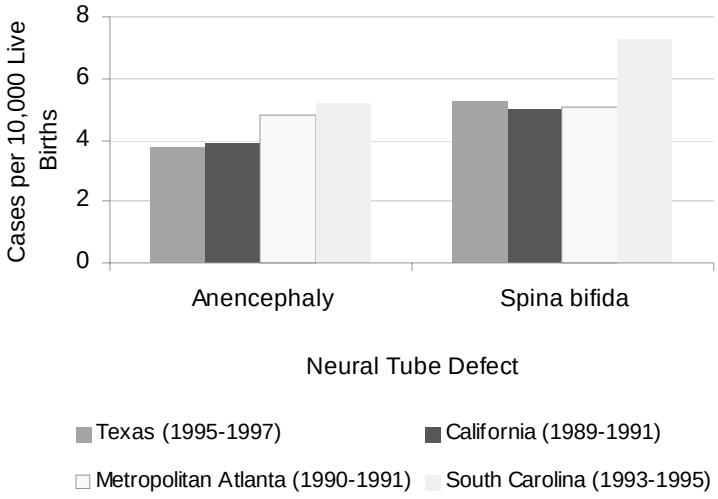
Data on the prevalence of neural tube defects (anencephaly, spina bifida, and encephalocele) from the Texas Birth Defects Registry are shown in Figure 1. The 1995-97 prevalence for anencephaly, spina bifida, and encephalocele was 3.78, 5.29, and 1.24 per 10,000 live births, respectively.

Figure 1: Birth Prevalence of Neural Tube Defects, Texas, 1995-1997



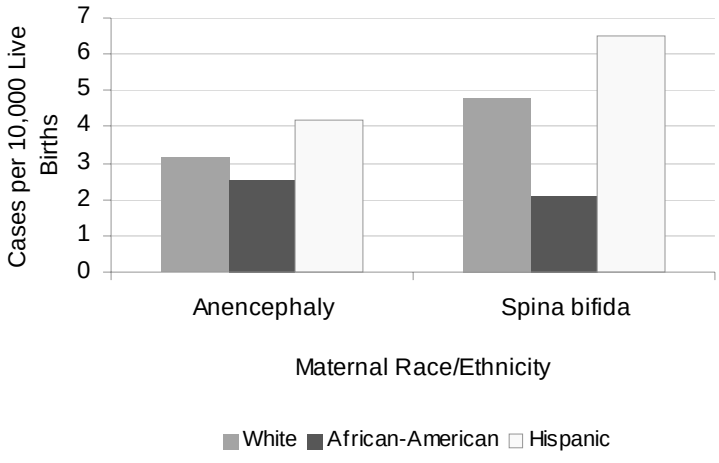
The combined NTD prevalence is approximately 1 case per 1,000 live births, which is the commonly reported NTD birth prevalence for the U.S. Rates for anencephaly and spina bifida were also similar to those from other U.S. birth defects registries (Figure 2). About seven percent of cases were associated with a known syndrome or chromosomal defect.

Figure 2: Birth Prevalence of Anencephaly and Spina Bifida by State



For both anencephaly and spina bifida, the highest rate was recorded for the youngest mothers (<20 years of age). For anencephaly, prevalence decreased as mother's age increased. Females had a higher prevalence than males in all three NTD categories. However, for anencephaly, this female excess was observed only for Hispanics. Anencephaly and spina bifida rates were lowest in African-Americans and highest in Hispanics (Figure 3).

Figure 3: Birth Prevalence of Anencephaly and Spina Bifida in Texas by Maternal Race/Ethnicity, 1995-1997



The ethnic differences were most pronounced for spina bifida. Hispanics with the highest rates were those who lived on the border with Mexico (Figure 4) or with the lowest educational attainment (Figure 5). Hispanic mothers born in Mexico had rates similar to those born in the U.S.

Figure 4: Birth Prevalence of Neural Tube Defects in Texas by Border Residential Status and Ethnicity, 1995-1997

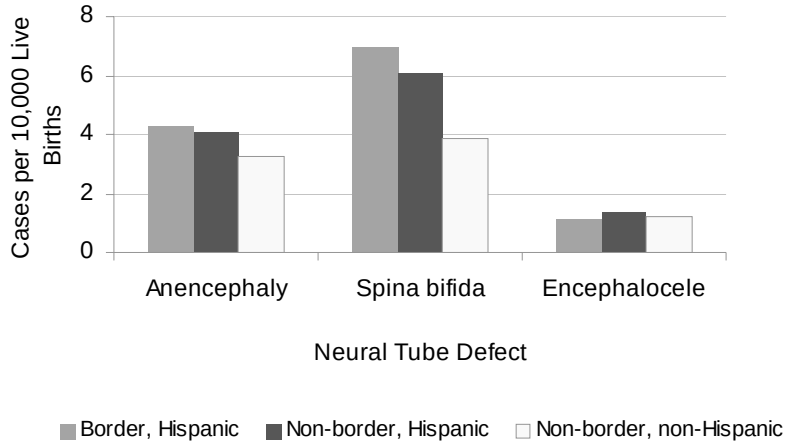
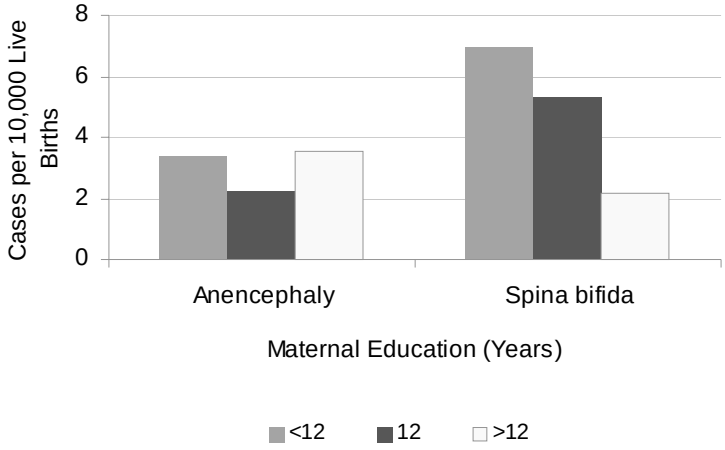


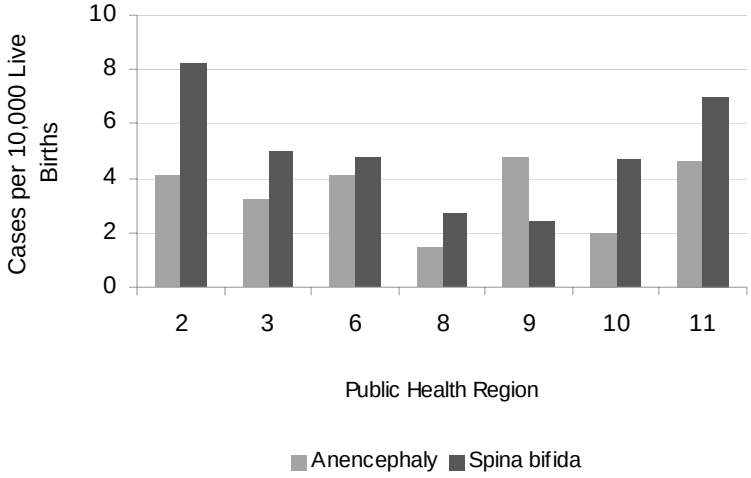
Figure 5: Prevalence of Anencephaly and Spina Bifida in Texas Hispanics by Maternal Education, 1995-1997



Spina bifida risk decreased with each increasing level of maternal educational attainment. For mothers with more than a high school education, there was no difference in spina bifida rates between Hispanics and non-Hispanics (data not shown).

Figure 6 shows variation in NTD rates by Texas region. The lowest NTD rates (5.66 cases per 10,000 live births) were in Region 8 (San Antonio), and the highest spina bifida rates were in Region 11 (12.90 for the areas of Harlingen/Brownsville/ McAllen/ Laredo/Corpus Christi) and Region 2 (13.65 for the areas including Abilene and Wichita Falls). Rates for anencephaly and spina bifida were higher in residents of counties bordering Mexico, compared to non-border residents of Texas.

Figure 6: Birth Prevalence of Anencephaly and Spina Bifida in Texas, by Public Health Region, 1995-1997



Relevant TDH Activities

Because of the strong evidence linking adequate folic acid intake with prevention of neural tube defects, a great deal of effort has been focused on increasing folic acid consumption among Texas women of childbearing age, particularly among groups with higher rates of NTDs.

From 1992 through August 2000, the Texas Neural Tube Defects Project (TNTDP) conducted a surveillance initiative, a folic acid intervention (recurrence prevention), and a case-control study for the 14 counties along the Texas-Mexico border. The City of Laredo Health Department and several other local health departments contributed to these projects. Published findings have recently become available (See Resources). In conjunction with this study, the Texas Birth Defects Monitoring Division (TBDMD) has undertaken the following activities:

- A statewide case-control study is being conducted to help find out more about the causes of NTDs.
- A statewide provider education initiative was undertaken in partnership with the U.T. Houston School of Public Health.
- The Texas Birth Defects Research Center and the University of Texas Health Science Center in San Antonio are conducting a statewide NTD recurrence prevention project. Women who have previously had an NTD affected pregnancy are 30 to 50 times more likely to have another affected pregnancy (recurrence) than women with no such history. This project involves identifying and educating these women, and providing them with a daily regimen of high-dose folic acid.
- The Texas Birth Defects Monitoring Division is collaborating with the Pan American Health Organization and the four bordering Mexican states to improve communications between these entities about birth defects, to exchange data, and to promote active birth defects surveillance in the Mexican states.

Statewide birth defects surveillance, including NTDs, is ongoing. Current TBDMD procedures call for expediting the processing of NTD cases for national and local studies, allowing for timely identification of elevated rates in specific geographical areas. For example, higher-than-expected rates of anencephaly were recently identified in Laredo, which led to a coordinated and rapid response by city/regional/central office.

The Texas Birth Defects Research Center (TBDRC) has funded collection of data about Texas women's knowledge and behavior regarding folic acid supplementation. This information has been collected through the Texas Behavioral Risk Surveillance System (BRFSS), which allows for comparison with other states which use the BRFSS. The Texas Women's Health Survey, which was administered in 1999 and again in 2001, was modeled on the National March of Dimes Gallup survey collecting similar information. Findings from these surveys allows for targeted folic acid education and intervention. For example, both of these surveys indicated that higher levels of education were associated with likelihood of taking folic acid and of being aware of its benefits.

Researchers at TDH are involved in many studies examining the causes of and risk factors for neural tube defects. These studies include:

- Hispanic Origin, Maternal Obesity, and Central Nervous System Defects;
- Biomarkers as Measures of Risk for NTD Development;
- Geographic Information Systems and NTDs;
- Blood Folate Survey of Texas Women;
- Diuretics, Appetite Suppressants, and Central Nervous System Anomalies;
- Relationship between Maternal Body Mass Index and Selected Congenital Defects;
- Maternal Occupations and NTDs;
- Maternal Insulin Levels and NTDs; and
- Periconceptional Folic Acid Deficiency as a Risk Factor for NTDs in Hispanics.

WIC Communications has recently developed the following resources for folic acid education: a bilingual flier, "Folic Acid: Females age 11 and older need folic acid everyday", and a videotape, "Folic Acid: What Every Woman Needs".

In addition, statewide folic acid education and prevention efforts are being conducted in partnership with university collaborators, the March of Dimes, community organizations, and other entities, largely through the auspices of the Texas Folic Acid Council (TFAC). TFAC is a statewide collaboration of public and private partners, with a strong leadership presence from TDH programs, including TBDMD, WIC, and Region 4. Activities of this group include the distribution of 20,000 "starter kits" aimed at increasing folic acid awareness and establishing a habit of taking a daily vitamin supplement in women of childbearing age. These kits are being distributed through WIC clinics. A public information campaign including print and broadcast public service announcements will take place concurrently with the starter kit distribution.

Resources

Websites

Texas Birth Defects Monitoring Division: www.tdh.state.tx.us/tbdmd/index.htm

Centers for Disease Control and Prevention: http://www.cdc.gov/ncbddd/folicacid/default.htm

Texas Folic Acid Council: http://geocities.com/txfolic/home.htm

Spina Bifida Association of Dallas: http://www.sbdallas.org/

March of Dimes: http://www.modimes.org/HealthLibrary2/FactSheets/SpinaBifida.htm

Publications

Presentation: Prevalence and Patterns of Neural Tube Defects in Texas, Mark Canfield, http://www.tdh.state.tx.us/tbdmd/conf38%2D59.pdf

TDH News Release, August 11, 2000, TDH Border Birth Defects Intervention Project Yields Dramatic Results

Taxes Birth Defects Monitor (TBDMD), Volume 4-2, Education Plays a Major Role in Folic Acid Supplementation. December 1998. www.tdh.state.tx.us/tbdmd/the.htm

Birth Defect Risk Factor Series: Neural Tube Defects, Texas Birth Defects Monitoring Division

TDH Accent on Health, December 19, 1997, New Folic Acid Requirement Begins New Year's Day

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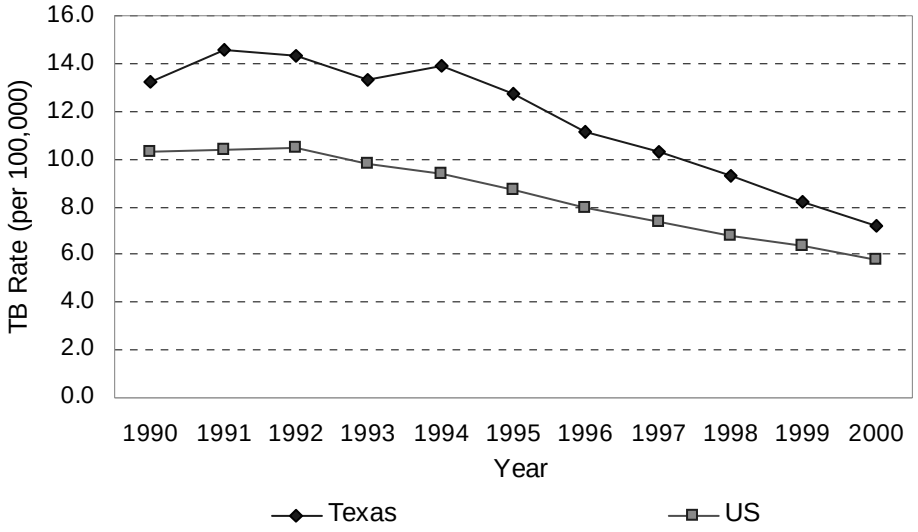
TUBERCULOSIS

Despite recent declines in tuberculosis (TB) in both Texas and the nation, TB remains a major public health concern (Figure 1). In the year 2000, 1,506 cases of TB were reported in Texas. TB continues to occur more frequently among males (65%) and minorities (83%) than among females (35%) and non-Hispanic whites (17%). Of the minority cases, 49% occurred in Hispanics, 23% in African-Americans, 19% in Asians, and less than one percent in American Indians (Figures 2 and 3).

Figure 1. TB Rates for Texas and the US



Over the last seven years, the number of TB cases in Texas has decreased 59% (from 2,542 in 1994 to 1,506 in 2000). However, TB continues to be a social, public health and economic problem for Texas. The stigma associated with TB in many cultures is a barrier to identifying infected individuals and treating patients. Treatment of each case requires a minimum of six months of treatment with two to four different drugs and can be psychologically, physically, and economically demanding. Occasionally, the demands can overwhelm patients, leading them to become non-compliant with their treatment regimens. Any interruption in treatment significantly increases the risk of the patient developing multi-drug resistant TB. If drug resistant TB is allowed to develop, the cost of treating a case can escalate from $2,300 to over $250,000 per case.

Critical action is needed to decrease the burden of TB in Texas. The TB Elimination Division can identify the health disparities that exist in the population by race/ethnicity, age, geographic area and risk factor. However, recognizing and overcoming the barriers to effective TB control in Texas will require a combination of short-term and long-term strategies implemented through effective collaborations with diverse partners including Federal, State, and local officials.

Figure 2. TB Rates for Males by Race/Ethnicity
Texas

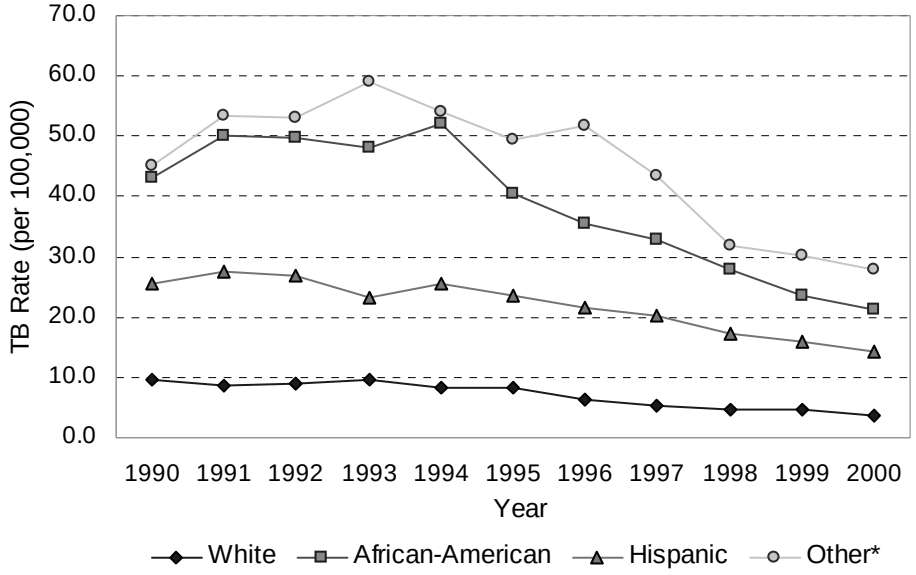
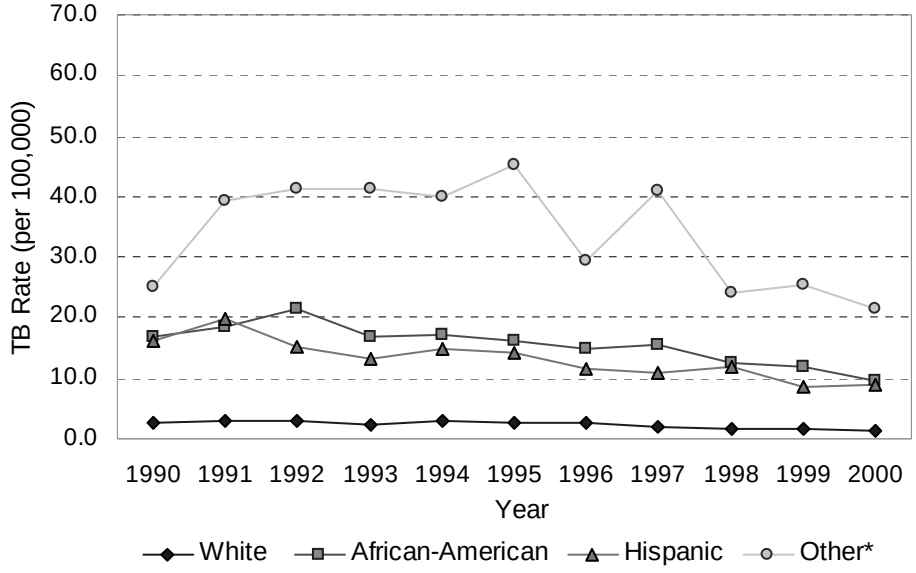


Figure 3. TB Rates for Females by Race/Ethnicity
Texas



* Includes individuals not classified as white, Hispanic, or African-American. The majority of these individuals will be of Asian origin.

Supporting Statistics

Tuberculosis is a preventable and treatable disease. However, efforts to control the disease are confounded by the demographics and social situations of populations at increased risk for TB in Texas. TB disproportionately affects racial and ethnic minorities. Although minorities comprised only 48% of the population, these groups accounted for

83% of all TB cases reported in 2000. The increase of foreign-born individuals entering the state has had a significant impact on the epidemiology of TB in Texas. The proportion of cases reported in the foreign-born increased to 41% in 2000 from 26% in 1995. Although people with TB in Texas reported a variety of countries as their place of birth, the most frequently listed were Mexico (60%), Vietnam (10%), and India (5%). The highest proportion of foreign-born cases occurred within the 35-44 age group and accounted for 19% of all cases in that age group. In addition to race, ethnicity, and foreign birth, other risk factors common to TB patients were diabetes (19%), alcohol abuse (16%), residence in a correctional facility within the last 2 years (10%), HIV infection (10%), non-injecting drug abuse (6%), homelessness (5%), and injecting drug abuse (2%). In addition, a majority of patients with TB are uninsured and lack access to medical services beyond those provided by public health agencies.

Geographic Differences

Border Region. The incidence of TB is not distributed evenly across Texas. Fourteen counties that border Mexico reported 17% of all cases in the year 2000 (Figure 4 and 5). Because of the frequent movement of individuals between Texas and Mexico, and subsequent difficulties in providing the necessary long term consistent care required to cure this disease, TB in the border region poses a unique threat to Texas and the rest of the United States. Texas borders four Mexican states: Tamaulipas, Nueveo Leon, Coahuila, and Chihuahua. The TB case rates per 100,000 population in these states for 2000 exceeded the Texas case rate of 7.4 and were reported as follows:

Tamaulipas – 38

Nuevo Leon – 26.7

Coahuila – 16.6

Chihuahua – 14.9

Figure 4. TB Rates for the 14 Texas-Mexico Border Counties

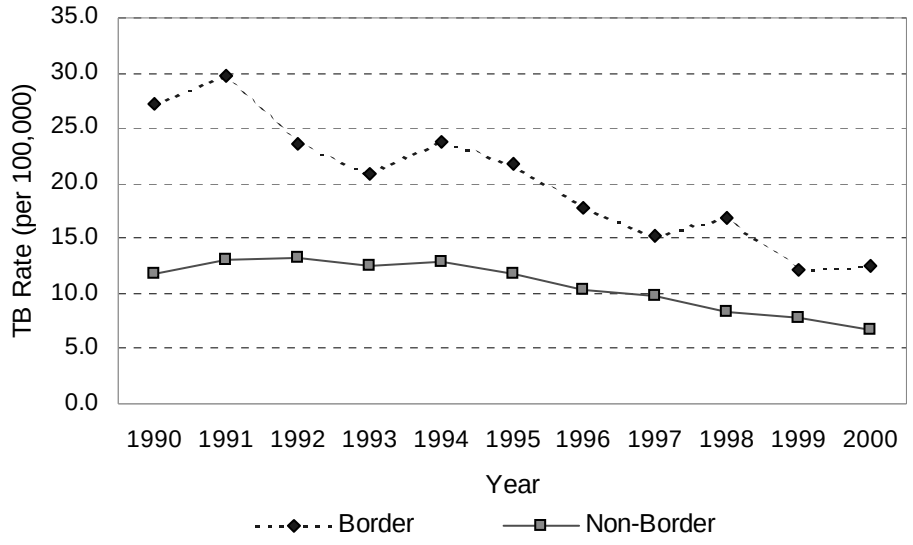
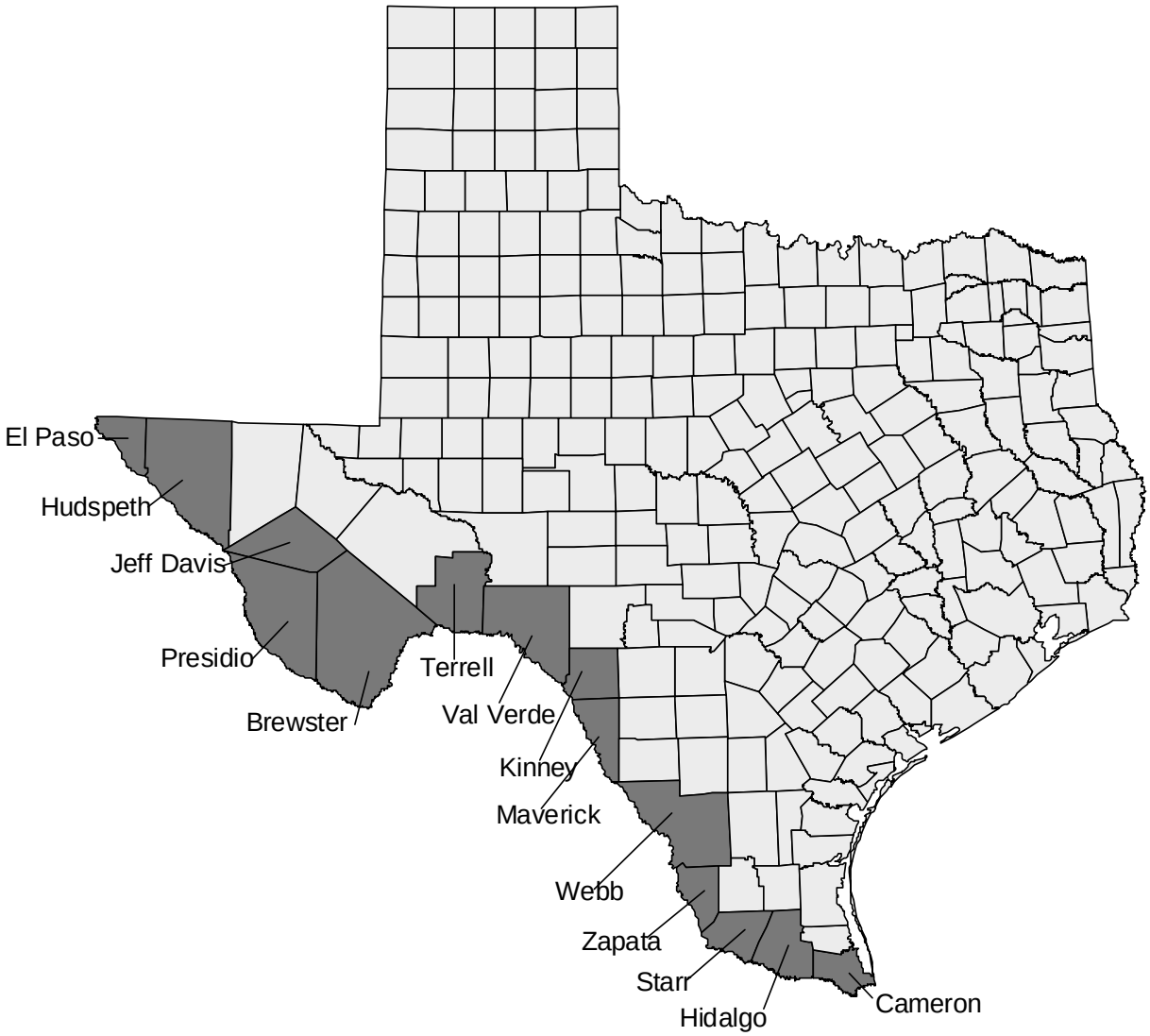


Figure 5. Texas-Mexico 14 Border Counties



Trans-border contacts pose a challenge for infection control in the community. In 1998, there were five million pedestrian border crossings. Individuals infected with TB and drug resistant TB coming from Mexico into Texas and the rest of the United States are a significant health concern. The limited public health resources and the short supply of health professionals complicate TB control in the border region.

Urban Region. The largest urban counties of Harris, Dallas, Tarrant, Travis, and Bexar which have approximately 45% of the state's population also had a disproportionate number - 57% - of all TB cases reported in Texas. Urban counties are faced with TB cases that occur in diverse populations where linguistic, cultural and economic barriers are a factor. Working to provide TB services to this population poses a momentous challenge.

Rural Region. Rural regions accounted for less than 25% of all TB cases reported in Texas during 2000. Although the incidence of TB is low in non-border rural areas, the distance that needs to be traveled and the scarcity of resources create barriers for reaching the population to be served. Only 60% of Texas counties have established public health departments. Many of these areas have lost TB expertise or lack specialized facilities. Justifying the maintenance of personnel that target TB in these low incidence areas is becoming increasingly difficult. Such decreases in program capacity have increased disparate conditions for TB management in the rural sectors of the state.

Relevant TDH Activities

The Texas Department of Health engages in a variety of activities that address disparities related to the burden of TB. The TB Elimination Division works with regional and local health departments to provide TB prevention and control activities across the state. These health departments are responsible for TB case management and work with communities and organizations that serve at-risk populations. The Texas Department of Health funds 27 local health departments, all regional health departments, and provides binational TB services through three binational TB projects. The Juntos Binational TB Project is in Ciudad Juarez, Chihuahua, Mexico and is a collaborating partner with the Texas Department of Health Region 9/10. The Grupo Sin Fronteras Binational TB Project has two sites: Matamoras and Reynosa, Tamaulipas, Mexico. The Los Dos Laredo Binational TB Project is located in Laredo, Texas and Nuevo Laredo, Tamaulipas, Mexico. Both of these Binational Projects collaborate with Region 11. These projects provide treatment to Mexican TB patients who have binational status. The cases treated by the projects must meet one of the following criteria:

- Patient lives in Mexico but has relatives in the U.S.
- Patient has dual residency in the U.S. and Mexico.
- Patient has contacts on both sides of the border, in the U.S. and Mexico.
- Patient starts treatment in the U.S. but returns to live in Mexico; some of these patients may continue returning to the U.S. to receive treatment and monthly monitoring. For example, binational patients who have been hospitalized at South Texas Hospital, return to Mexico when they are discharged but continue to return to South Texas Hospital as outpatients for follow-up. Binational project outreach workers facilitate return visits to South Texas Hospital. This type of binational patient continues on directly observed therapy in Mexico delivered by binational project outreach workers.
- TB patients referred from the U.S. for treatment or follow-up in Mexico
- “Special cases”: those patients who may or may not fit the above criteria but who may be referred to projects by the Social Security Administration (SSA), Instituto Mexicano del Seguro Social (IMSS) or ISSTE for case management because they are difficult cases believed to be better managed by the projects. These patients include: a) patients with compliance problems, b) drug-resistant patients, c) HIV-TB patients, d) diabetics, e) intravenous drug users, and f) indigent patients who for reasons of financial hardship cannot travel to TB clinics.

TB Net. The TB Elimination Division works with the Migrant Clinicians Network (MCN) to track TB patients as they move across jurisdictional lines/borders following work opportunities. This project tracks patients to assure that a patient continues their treatment. Working with MCN, TB patients who are identified in TB clinics across the country can be enrolled in TB Net and receive proper treatment by presenting their case information to another clinic site. The patient's medical information is maintained in a confidential database and is available to medical professionals with patient consent by calling the TB Net 1-800 number.

TB Expert Medical Consultation. Consultation is a critical need when complicated TB cases are identified. The TB Elimination Division works with six TB experts across the state to assure that physicians who identify complicated cases, such as drug resistant cases, receive consultation on the management of those cases to ensure that those cases are properly treated.

Directly Observed Therapy (D.O.T.). The number of TB cases reported to the Texas Department of Health is the lowest in over fifty years. The steady decline in TB is attributed to the use of D.O.T. which is the practice of watching a patient take every dose of medication given. This practice assures that the medications are taken as directed and assures that a patient completes their treatment. As part of D.O.T. patients are also evaluated for drug toxicity. This provides opportunities to further augment benefits to the individual, especially those with co-morbid medical conditions such as HIV or diabetes and results in better cure rates and more importantly, less drug resistant TB

Interpreter Service. The TB Elimination Division working with the Refugee Health Screening Program provides interpreter training to local areas that have a significant number of foreign-born persons who have a linguistic barrier to receiving TB services.

Resources

The following is a list of TB resources that can be used to identify and/or address health disparities in Texas.

Tuberculosis in Texas Statistical Report
TB Update
Texas TB Experts
Texas TB Coalition
Ten Against TB
Texas Office of Border Health
Texas Center for Infectious Diseases
South Texas Health Facility
Texas Tuberculosis Education Center
TB Elimination Division Website – www.tdh.state.tx.us/tbl/